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Ed Word

My Name Is Will and I Have an X Problem

Please send feedback and something wrapped in bacon to ***will@maximumpc.com.***

Over the years, I've made some startling confessions in this column—the words "I love OS X" earned me a few hate letters. But now it's time to brace yourself for my most startling confession yet: I'm addicted to 4X games, the classic turn-based universe-domination titles in which you eXplore, eXpand, eXploit, and eXterminate. This genre was last popular sometime around (gulp) 1993.

When I'm picking out a title at my local game shop, I don't beeline for the 4X section, pining for better days. In fact, if you were to place a copy of Call of Duty and the latest empire builder side by side, I'd reach for the shooter because I know it will be more fun. But if you somehow tempt, coax, or coerce me into playing a good 4X game—from Master of Orion to Galactic Civilization—I'm in big trouble. This is when I start showing all the signs of addiction. A quick one-hour game invariably turns into a marathon session. I build my meager empire, one solar system at a time, subsuming alien cultures weaker than mine—using overwhelming force if necessary. A negotiation here, a small-scale war there, and pretty soon it's 4 a.m., and I'm wondering who drank all the Red Bull.

And that's when I decide I'm going to take just one more turn. Or maybe two.

Then it snowballs even further. I zombie through days at work and spend sleepless nights plotting my next move against the almighty Prophet Zarquon, who runs a three-planet hegemony that's the next stop for the United Federation of Will's Flotilla of Love, Happiness, and an Array of Interplanetary Railguns On the Off Chance that Love and Happiness Don't Get the Job Done.

So that's my addiction, and it's particularly topical thanks to a new game called Sins of a Solar Empire, which is going to do for the 4X genre what Dune 2 and C&C did for strategy games. By ditching turn-based gameplay for a real-time design, Sins retains the compelling depth and complexity of the 4X genre while removing the things that irked me, like waiting for your opponent to plan his turn. In return, you get glorious space battles in which tactics, politics, and economy all matter. In short, it's a game that I sit down to play and don't look away from for at least four hours.

Sins is by no means perfect. It's essentially multiplayer only, with no campaign to gradually introduce you to very complex gameplay. While this is a problem, the fundamental game design is so brilliant that strategy fans shouldn't overlook Sins. Trust me, you won't be disappointed.

Will Smith

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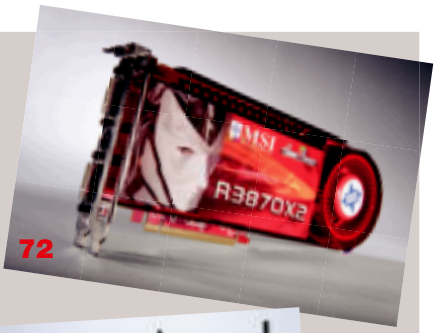

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Smooth Sailing for Blu-ray?

Blu-ray backers are hoping that an end to the optical format war will spark sales of high-def discs.

Even if HD DVD drops out, the reigning high-def disc format will have to contend with other competitors

Ever since Warner Bros.'s dramatic defection to Blu-ray on the eve of this year's CES, it's been widely assumed that HD DVD is done for. As it stands, Blu-ray now has the backing of five major Hollywood studios versus HD DVD's two: Paramount and Universal. Those two studios have gone on record saying that they're sticking with HD DVD despite Warner's move, but that could have more to do with contractual obligations with Toshiba (HD DVD's backer) than a sincere belief in the format's future.

Steve Jobs thinks the future of high-def is direct-to-TV streaming, à la the Apple TV.

For now, Toshiba seems determined to make a go of it, slashing the prices of all of its HD DVD players by 40-50 percent in hopes of ramping up market share. Research firm Gartner, however, calls this "useless resistance." A recent report by the firm states: "Toshiba's price-cutting may prolong HD DVD's life a little, but the limited lineup of film titles will inflict fatal damage on the format." Gartner goes on to predict a clear victory for Blu-ray by the end of 2008.

Say Blu-ray does triumph. Will it prompt consumers to finally buy high-def disc players and movies en masse? Not according to Apple CEO Steve Jobs, who recently made the claim that optical discs are an obsolete content distribution method. And indeed, while the two optical formats have been duking it out, the Hollywood studios have been forging online-distribution partnerships. The most high-profile of these involves the updated Apple TV, which now lets you stream both standard- and high-def content that you buy or rent from iTunes directly to your TV. A set-top box by Vudu (**www.vudu.com**) offers similar functionality, as does the Xbox 360 via Microsoft's Live Marketplace (in fact, movie director Michael Bay recently made waves by accusing Microsoft of supporting HD DVD just to fuel format confusion and drive frustrated consumers to its online store).

It all sounds very juicy, but communications analyst Michael Inouye of market research firm In-Stat isn't convinced of the online threat: "Until we get much larger data pipes for downloading, HD will be a pipe dream. I would imagine that quite a few consumers will not accept video 'hiccups' should they occur as they download the video (in cases where they stream the content). And if the consumer wishes to upgrade to larger data-transfer rates, it will likely come at a price."

In-Stat analyst Gerry Kaufhold offers up another factor: "Cable TV operators and the TelcoTV services provide you with your subscription TV service *and* your broadband Internet service, so they will continue to make sure their pay-TV services provide the highest convenience, the best image quality, and the most recent new titles so that they won't lose too much of their user base to the Internet-delivered services." That should come as little consolation to the Blu-ray camp, however.

We'll render our own hands-on assessment of the major movie streaming/downloading services in next month's issue, so stay tuned.

TOM
HALFHILL

Low-Power Newbie: the x86

In the microprocessor universe, there's low power and then there's *low power*. These days, a desktop PC processor may be called low power if it consumes less than 100 watts. Notebook processors use tens of watts. But for some systems—especially ultramobile devices expected to run for days on a battery charge—low power means one or two watts, or even less.

The x86 architecture, king of PCs, is largely absent from the true low-power realm. Tear down a cell phone, iPod, or digital camera and you won't find an x86. Most likely, you'll find chips based on a 32-bit British RISC architecture widely licensed by ARM. The x86 is popular with developers, but it's too hot for your pocket.

Now there's change afoot. Intel and VIA Technologies are introducing new x86 chips designed to push the architecture into consumer electronics and other products in which lower power is a requirement. Actually, VIA has been doing this for 10 years with its Centaur Cx-series processors. But VIA has won minuscule market share and scant brand recognition outside the semiconductor industry. Now that Intel is entering the low-power x86 derby in a big way, things may change.

Intel's entry is code-named Silverthorne. It's a fully compatible x86 processor that initially slashes power consumption to the one- or two-watt range. Future versions, Intel says, will run at 2.0GHz while burning less than one watt. Early samples are already in customers' hands and appeared in prototype products in January.

VIA's contender is code-named Isaiah. It, too, is a fully compatible x86 design. Initial chips will burn less than 3.5W at 1.0GHz and appear by summer. VIA claims to measure power consumption more rigorously than Intel does and says that Isaiah is more competitive with Silverthorne than the prerelease numbers indicate. But Intel has a clear manufacturing advantage. Silverthorne will debut in Intel's latest 45nm high-k metal-gate fabrication technology, whereas Isaiah is manufactured in an ordinary 65nm bulk-CMOS process.

Intel and VIA are taking different approaches with their new x86 designs, which I'll cover in future columns. Neither design is as power-stingy as ARM's smallest processors. However, the big news is that the x86 is moving in a new direction—into your pocket.

Tom Halfhill was formerly a senior editor for Byte magazine and is now an analyst for Microprocessor Report.

Rumor Mill: Vista Replacement in 2009?

According to online sources, Microsoft is pushing up the release of Vista's follow-up, code-named Windows 7, from 2010 to late 2009. These sources claim to have early alpha versions of the nascent OS, leaked by OEMs. The official word from Redmond is "no comment," but we wouldn't be surprised if MS is putting pressure on its dev team to quickly roll out a follow-up to Vista.

Cheap Penryns Are Here!

Intel turns the spigot on its 45nm CPUs

The Core 2 Extreme QX9650 suddenly has company, now that Intel has added seven more-affordable 45nm Penryn CPUs to its roster.

In quad-core trim, Intel is now selling a 2.83GHz Core 2 Quad Q9550 for $530, a 2.66GHz Q9450 for $316, and a 2.5GHz Q9300 for $266. Of these, the Q9550 and Q9450 parts feature the maximum 12MB of L2 cache. Oddly, the Q9300 features just 6MB of L2—less than that of the similarly priced 2.4GHz Core 2 Q6600, which sports 8MB. We suspect the Q9300 is Intel's way of repurposing bad cache dies, à la AMD's tri core.

Intel is also shipping four dual-core Penryn chips: a 3.16GHz Core 2 Duo E8500 for $266, a 3GHz E8400 for $183, a 2.66GHz E8200 for $163, and an odd-duck 2.66GHz E8190 for $163—an E8200 without support for virtualization acceleration or Intel's TXT La Grande security support. Intel says the E8190 fulfills an OEM request for a low-end proc sans the special features.

Nvidia Snaps up Ageia

PhysX is dead! Long live PhysX!

We predicted Ageia would be acquired, but we thought AMD would do the deed in response to Intel's purchase of Havok. Instead, Nvidia stepped up—likely motivated by similar interests.

Nvidia was unwilling to divulge details of the acquisition until its quarterly conference call, which occurred after our deadline, leaving us to speculate on the company's press release. This part in particular caught our eye: "…physics processing is made up of millions of parallel computations. The Nvidia GeForce 8800 GT GPU, with its 112 processors, can process parallel applications up to two orders of magnitude faster than a dual- or quad-core CPU." Our assessment? Nvidia is interested in only the software side of Ageia's intellectual property. PhysX as a stand-alone add-in card remains as dead as ever.

GAME THEORY

THOMAS MCDONALD

The Sundance of Gaming

Every serious PC gamer needs to pay attention to the Independent Games Festival (**www.igf.com**). Now in its tenth year, the IGF is an annual gathering that allows small and indie developers a chance to show their wares and discuss their craft.

Since conventions and trade shows bore me spitless, I've never gone and probably never will. But IGF does something very, very important for the future of PC gaming. Each year, it creates a roster of nominees for the IGF Awards. Like conventions, annual awards are also low on my love list, but the IGF nominees are something different. This is the soil where the seeds of PC gaming grow. It's what we have that consoles don't. Anyone with a little programming ability and a lot of passion and spare time can create a PC game and get it on the web where millions of people can download and play it.

This means that anyone—lots and lots of anyones—can and do create and upload all kinds of useless and offensive crap. I have neither the time nor the patience to wade through that download dunghill looking for a stray diamond, and thanks to the IGF, I don't have to. The festival plucks quality games from obscurity and gives them a forum to shine.

Two of the best—Crayon Physics Deluxe and World of Goo—emerged from Carnegie Mellon's Experimental Gameplay Project, which set a goal of creating 50 games in a single semester. Each game was done in less than a week by one person to prove how quickly imaginative solo programmers can create casual games. The elegant simplicity of Crayon Physics—in which drawn objects take on physical properties—is a thing of beauty and a testament to the goals of EGP.

There are too many quality games among the nominees to really do them justice in this space. Audiosurf, Gumboy Tournament, Synaesthete, and many others are already available as demos and downloads, while others are still edging toward final builds. Major mainstream releases are well and good, but it's the lone programmer and the passionate amateur who often produce the quirky and interesting work that is unique to PCs.

And just remember, the 2006 Student Showcase winner was a little game called Narbacular Drop. You know it better as Portal.

Thomas L. McDonald has been covering games for 17 years. He is Editor-at-Large of Games Magazine.

The End of All You Can Eat?

Time Warner Cable, AT&T, and Comcast—three of the nation's largest Internet service providers—are reportedly considering changing their broadband service plans so that customers are billed on a consumption basis, as opposed to the current business model: connection speed.

BroadbandReports.com recently obtained a memo leaked from Time Warner Cable revealing the company's plan to test such a concept with new customers of its RoadRunner cable broadband service in Beaumont, Texas. In the memo, the ISP claims the change will "impact only 5 percent of subscribers who utilize over half of the total network bandwidth."

Time Warner's assessment indicates that the company believes only a fringe element of its customer base is using P2P file-sharing networks. The impact will be much broader, however, if it cripples the nascent online movie-rental market that Apple, Microsoft, Netflix, and other companies have just begun to explore.

Undersea Cables Damaged

Web traffic in India and the Middle East slows to a crawl

In less than a week's time, four undersea cables that carry a large percentage of Internet traffic throughout much of the Middle East and India were mysteriously damaged. Initially, it was believed that two cables located off the Egyptian coast were severed by an anchor, but the Egyptian government later stated no ships were in the area when the break occurred. While the cause of the damage to these cables as well as a subsequent third cable off the coast of Dubai is still undetermined, unofficial reports blame damage done to a nearby fourth cable on a power issue. The incidents have had a widespread effect on Internet usage, reducing bandwidth in some regions by as much as 70 percent.

So far, neither the telcos nor governments of the affected countries have voiced concerns over foul play.

To think, parts of this region have been deprived of YouTube!

Netscape Bites the Dust

After years of languishing in obscurity, the browser that started the web revolution is laid to rest

The bundling of Internet Explorer with every copy of Windows left Netscape neglected and vulnerable to mistreatment by AOL, which purchased the browser in 1999.

Microsoft Bids Big for Yahoo

How much is Yahoo worth? Microsoft is offering to purchase the company for $44.6 billion in an attempt to keep its Internet strategy from falling apart under the weight of a Google-controlled search market.

Data released by Nielsen/Netratings in December shows that Google controls 56.3 percent of the U.S. search market, with Yahoo eating Google's dust at 17.7 percent. Microsoft takes third at 13.8 percent, suggesting that a Microsoft-Yahoo combination would still trail far behind Google in terms of market share.

Even so, Google is bracing for an economic impact from the proposed merger. The Mountain View, CA-based company fired the first volley shortly after Microsoft CEO Steve Ballmer's proposal became public at the end of January. On the official Google Blog, Senior Vice President David Drummond questioned the merits of the proposed deal, suggesting that Microsoft might very well try to monopolize its way to online success.

"Could a combination of the two take advantage of a PC software monopoly to unfairly limit the ability of consumers to freely access competitors' email, IM, and web-based services? Policymakers around the world need to ask these questions—and consumers deserve satisfying answers," Drummond said.

The final word might not even be Google's, Yahoo's, or Microsoft's: U.S. lawmakers intend to examine the proposed acquisition, echoing an antitrust scenario that Microsoft is all-too-familiar with by now. Expect this proposal to come under fire for quite some time.

eSata Loses Its Power Cord

Take that, extra cable. The Serial ATA International Organization recently announced that it's pursuing a new specification of the eSATA standard. In this version, eSATA will be joining its connection peers by offering power over the data cable itself. The new cabling will remain compatible with existing eSATA plugs and not suffer from any speed reductions.

Cyber Security = Spying

In a profile appearing in *The New Yorker* magazine, U.S. Director of National Intelligence Mike McConnell lays out his vision for a safer cyberspace: The government should have the authority to look at every piece of information traveling over the Internet in the United States. Only in this way can the country's financial institutions be safeguarded from cyber attacks by terrorists, according to McConnell. Let's hope Congress doesn't just roll over on this one.

Listen and Learn

No BS MAXIMUM PC

A lot goes on behind the scenes in the course of making this magazine. There are the trials and tribulations of product testing, the heated debates about new technology developments, and the ongoing tirade that is Gordon Mah Ung's hate. You can listen in on all this and more during our weekly No BS Podcast (get it at MaximumPC.com).

FUNSIZENEWS

BAD ON BLU-RAY

Later this year, Blu-ray fans can expect new movie releases to feature long-promised bonus material, such as picture-in-picture commentaries. Trouble is, Blu-ray players sold thus far (other than Sony's PS3) are incapable of playing the new version 1.1 content. Players made with the 1.0 profile will be able to play the movie itself, but nothing else. In other good news for early adopters, the Internet connectivity we've also been hearing about is part of a later 2.0 profile.

SONY TO DIS-CONNECT

On March 31, 2008, Sony will shut down its online Connect Music service, in yet another sign that the music biz is giving up on DRM. In much the same way iTunes serves iPods, Connect sold music in Sony's proprietary ATRAC file format, which could only be played on the PC used to purchase the music or a Sony device. Now that Sony is abandoning ATRAC, owners of that music are left without a player upgrade path.

TIVO TRIUMPHS

The U.S. Court of Appeals for the Federal Circuit has upheld a jury's verdict finding that Dish Network's DVRs infringe on TiVo's time-warping patent. As a result, Dish Network will be forced to pay TiVo $89.6 million in damages. The appeals court also upheld a permanent injunction barring Dish Network from selling or providing services to the infringing devices.

BREAKING: IPHONE STILL SUCKS!

It's been nearly a year since Apple's blessed iPhone hit store shelves, and we're still scratching our heads. Hacked applications are a poor alternative for official support on Apple's side. Where's that promised SDK? It's hard for us to find answers using the iPhone's atrocious EDGE-based Internet connection. Hey, Apple, let us know when you're ready to make improvements that *aren't* related to the device's storage limits.

LOCAL AREA NETWORKS

Wired **vs.** Wireless

With 802.11n Draft 2.0 routers and wireless network adapters becoming both ubiquitous and relatively inexpensive—and with 802.11n media center extenders finally reaching the market—you might be wondering if building an old-fashioned wired network is worth the trouble and expense.

There's no question that stringing wires around your house is a royal pain, especially if it lacks a crawl space or attic, and if you're going to bother with a wired network at all, you'll need to invest in a gigabit switch (any 802.11n router worth its salt has a built-in gigabit switch, but you'll need more than four measly ports). You'll also need to buy bulk Cat5e cable, RJ45 jacks, mud rings, wall plates, and perhaps a few new tools.

We decided to compare the deployment cost, convenience, and performance of a wireless network powered by a high-end Wi-Fi router with that of a wired network controlled by a high-quality gigabit switch in four usage scenarios.

BY MICHAEL **BROWN**

round 1

WIRELESS NETWORK
Linksys WRT600N
802.11n Draft 2.0 Router
$250, www.linksys.com

WINNER: WIRELESS NETWORK

round 2

WINNER: WIRED NETWORK

BENCHMARKS

	GIGABIT WIRED	802.11N WIRELESS
TCP THROUGHPUT: SHORT DISTANCE (Mb/s)	**357**	127
LARGE FILE TRANSFER: SHORT DISTANCE (SEC)	**84**	238
SMALL FILE TRANSFER: SHORT DISTANCE (SEC)	**30**	85
TCP THROUGHPUT: LONG DISTANCE (Mb/s)	**362**	28
LARGE FILE TRANSFER: LONG DISTANCE (SEC)	**82**	928
SMALL FILE TRANSFER: LONG DISTANCE (SEC)	**28**	253

Best scores are bolded. See ***http://tinyurl.com/yo8qa4*** *for detailed test criteria.*

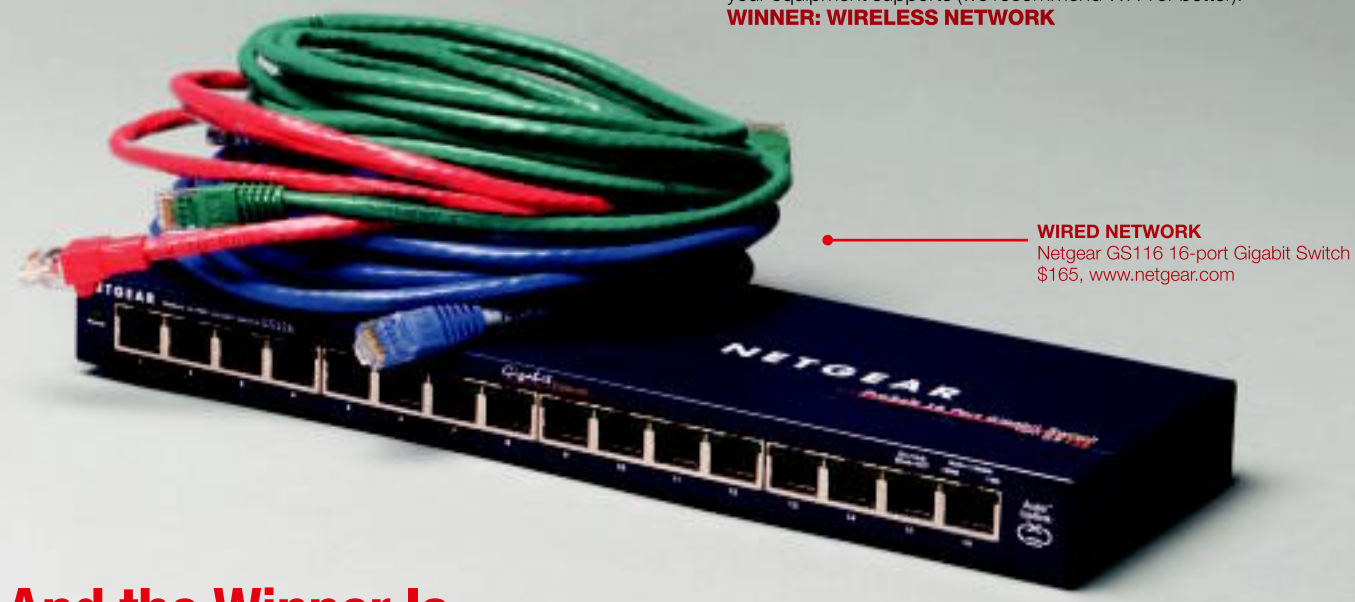
round 3

WINNER: WIRED NETWORK

round 4 Connecting to the Internet is the one scenario in which the speed of your local network really doesn't matter. The typical DSL connection will provide bandwidth of less than 6Mb/s; cable modem connections are usually faster, but not enough to outstrip the perfor-

Since you won't gain anything by using a wired connection to browse the web, you might as well enjoy the freedom a wireless connection has to offer. Just be sure to use the best wireless security that your equipment supports (we recommend WPA or better).

WINNER: WIRELESS NETWORK



WIRED NETWORK
Netgear GS116 16-port Gigabit Switch
$165, www.netgear.com

And the Winner Is...

wired network

going to need a router in order to share your Internet connection any-

Building out a wired network takes a lot of elbow grease, but it's certainly not a costly proposition if you do the work yourself. And an 802.11n Draft 2.0 router with a gigabit switch is only marginally more expensive than lesser hardware (the dual-band model reviewed here is the exception to the rule). You'll never regret the commitment to having

Our consumer advocate investigates...

✓Camera Conundrum ✓How Much Is ALchemy? ✓EZVideotools Hard to Reach

Chloe, ***watchdog of the month***

CAN I HAVE THE PRICE YOU QUOTED ME?

*Dog, I recently ordered a Panasonic SDR-H200 Camcorder from Camera Addict (**www.cameraaddict.com**) for $475; most other shops sell it for at least $600. I called Camera Addict and asked if the unit was refurbished; the customer service rep said it was new. I placed my order and received an email the next day asking me to confirm my order. I became suspicious after the company tried to sell me an extended-life battery for $90—the rep explained that the battery the camera comes with "only lasts 25 minutes." The sales rep then tried to sell me additional accessories and warranties. I soon started to realize that the price they advertised was too good to be true.*

The knockout punch came when the guy on the other end of the line asked me if I wanted the import model or the U.S. retail model. I said I wanted the U.S. model without any additional products or warranties, and he said my total would be $699.99. I asked him why it was so much when it's listed at $475 on the website; he explained that the Japanese model costs $475, but the U.S. model costs $699.99.

I told the rep I wanted to cancel my order and I was asked why. I said the company was running a bait and switch. He told me I didn't know what I was talking about and that he'd like to cancel my order. I said, "Yes, please do that." Today the SDR-H200 is listed on the Camera Addict website at $545, but it still says nothing about it being a Japanese model, which I assume will have menus in Japanese and may not have warranty protection in the United States.

—Chris Schutze

Chris, you've just run into a textbook hard-sell sales tactic that's long been used to sell cameras and electronics online and by mail order. It works by sucking you in with "can't pass up" pricing on the camera. Then you're upsold on batteries, warranties, cases, and other paraphernalia of generally low quality. The vendor usually tells you, "Well, you'll need a charger, right? And a battery—this camera doesn't come with a battery and charger you know." Of course, Canon, Panasonic, Sony, and other companies don't sell cameras without batteries and chargers; unscrupulous vendors simply unbundle camera systems and sell individual components at a high price.

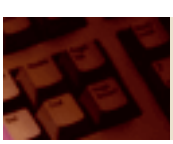
The Dog was unable to reach Camera Addict for comment before we went to press, but the company certainly raises red flags on the Internet. At ResellerRatings.com, the store has received a six-month rating of 0.30 out of 10. The Better Business Bureau doesn't have an individual report on Camera Addict; instead, it associates the business with Broadway Photo, a Brooklyn, New York-based company that also does business under the names A&M Photo World, Best Camera, Cameratopia, Digital Liquidators, Ghu, Millennium Camera, Preferred Photo, Prestige Camera, Quest4Cameras, Regal Camera, The Digital Expo, Tronicity, and Wild Digital. The verdict from the BBB? Bad. The BBB site states: "This business has an unsatisfactory record with the BBB." Furthermore, "Complaints to the Bureau indicate that this firm uses high-pressures sales tactics after consumers place their orders. After ordering merchandise, consumers report receiving a phone call from the firm's customer representatives attempting to sell additional items. Representatives allegedly try to persuade consumers to buy the U.S. warranty, as well as accessories like cables, peripherals, and software, or lead consumers to believe the product will not work if additional merchandise is not purchased. In some cases, if the consumers declined, an email was sent advising them to cancel their orders because the item was on back-order despite being listed as available on the firm's website. Consumers also reported unauthorized charges on their invoices. When trying to dispute such charges, consumers report difficulty talking to management, claiming they are verbally abused by the company's staff."

A classic tactic to get you to buy a camera is to advertise it at a low price and then reveal you're buying an import model without a warranty after you've been sucked in.

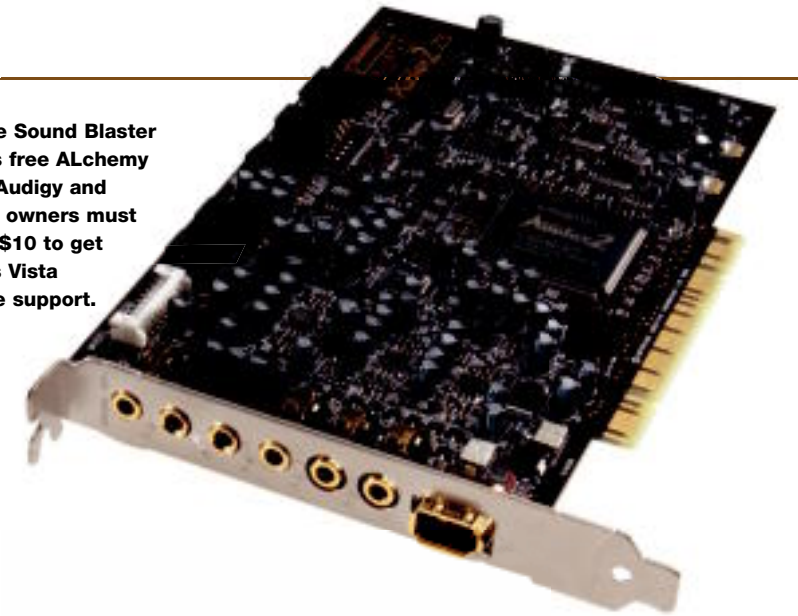
Over the past three years, the BBB has logged 929 complaints regarding Broadway Photo and the stores associated with it. The company has taken steps to resolve some complaints though, but 200 customers have reported being dissatisfied with the fixes offered.

How can you avoid these kinds of "deals"? First, the old mantra continues to be true: If it sounds too good to be true, it usually is. Companies that employ these tactics know that greed is a powerful emotion. The chance to get a $1,800 camera for $900 from a seemingly legit store can get normally rational consumers to throw caution to the wind. The next time you get excited about a great price, stop and consider why the product is so cheap. You should also make sure you make your purchase with a credit card—not a debit card—with good purchase protection. Some cards even offer their own extended warranties. Make sure you read the fine print concerning the item you want to buy, as well. Watch for excessive shipping and handling fees, and pay close attention to restocking fees and return policies.

And obviously, the Dog doesn't recommend shopping at Camera Addict, Broadway Photo, or its associated stores. Woof.



Got a bone to pick with a vendor? Been spiked by a fly-by-night operation? Sic the Dog on them by writing **watchdog@maximumpc.com.** The Dog promises to answer as many letters as possible, but only has four paws to work with.



While the Sound Blaster X-Fi gets free ALchemy drivers, Audigy and Audigy 2 owners must pony up $10 to get Windows Vista hardware support.

WHY ISN'T IT FREE FOR ME, TOO?

Dog, the March Vista Tips story said that ALchemy drivers for X-Fi and Audigy owners are free. They're not—at least, not that I know of. Creative Labs is charging owners of its Audigy cards $9.99 to download ALchemy and enable DirectSound3D in Windows Vista. I don't think consumers should have to pay for the fix. You should let readers know that the Audigy download will cost them. If you can get Creative to do the Audigy ALchemy program for free, I would love to know.

—R. Gardner

The Dog looked into this and, indeed, we incorrectly stated that Creative Labs provides Audigy and Audigy 2 ALchemy drivers for free for Windows Vista. Only drivers for the X-Fi series of Sound Blaster cards are available for free. Why isn't ALchemy free for everyone? The Dog asked Creative and was told: "As a gesture of appreciation to the users of our current soundcard line, which is X-Fi based, we absorbed the cost of development for ALchemy, so our customers could experience the full benefits of hardware-accelerated audio in legacy DirectSound game titles. ALchemy's popularity of more than a million free downloads inspired users of our previous-generation Audigy-based cards to contact us about a solution for the issues of legacy DirectSound game titles running on Vista. We redirected some of our engineering resources to develop an independent version of ALchemy for Audigy, while still absorbing the majority of the development cost while passing on a nominal fee to customers."

The Dog thinks that giving away the driver would certainly make people happy, but $10 really isn't an exorbitant fee if legitimate costs were involved in its development. That you can get hardware audio acceleration in Vista on a four-year-old soundcard should actually be applauded (even if the cost is $10), as most hardware vendors would have dumped you in the river.

EZ VIDEO, HARD TO CONTACT

I have been trying to find a video converter that will allow me to watch Real Media files on my cell phone, a Nokia 9300. I downloaded and paid for EZ MPEG To RM Converter at ***www.ezvideotools.com****. It seemed like a professional site, but I was wrong. As far as I can tell, the site is still running and will still take your money with PayPal but will not send the registration name or code required to use its software beyond the trial period of 15 videos.*

I emailed the company three times and never got a response. I also paid for Easy Video Converter, which was supposed to convert any video format to any other format. I did get a code for it, but of course, it didn't work as advertised.

Please know that this is not about the money. It's just the principle of the thing. I know that I won't get my money back, so at least let me get what I paid for.

— Lloyd Kuhnle

The Dog made numerous attempts to reach the operators of EZvideotools.com but had no success. Your problem might be lost in translation, though. The site is registered to a company based in the Qingdao province of China. The Dog also sniffed around the web to see if others have complained about the company, but surprisingly, the Dog couldn't locate anything that set off alarm bells. Since the company actually did respond to you once, the Dog recommends that you continue to email the company for a code to activate the product. In the meantime, contact PayPal to dispute the payment. Although PayPal isn't known to be particularly good with consumer complaints and disputes, you should at least give this avenue a try. Keep in mind that any dispute must be filed within 45 days, and PayPal is very strict about the deadline. The Dog recommends that other readers avoid EZvideotools.com's products until he can ascertain what exactly is going on with the company. Woof. MPC

BUIL

D YOUR OWN NO-COMPROMISES $1,500 PC

With the right parts and a little bit of elbow grease, you can have yourself an affordable DIY rig that does it all!

Any fool can spec out the ultimate Dream Machine. Just open up your wallet, pull out the Visa card, and tell the web store to overnight its most expensive parts to you. Voila! You've got the makings of a badass rig.

It's an entirely different story when you're building a machine on a budget. You've got to carefully weigh your options, consider every possible combination of parts, and make choices you know you can live with—because, typically, you will make some sacrifices. To be honest, the whole process can be downright painful. When we built our $1,500 PC last year (February 2007), we had to break so many of our own minimum spec guidelines that no one was truly satisfied with the results.

But this year is different. We found the job of building a $1,500 rig actually pleasurable—with minimal trade-offs. In fact, we're tickled pink with the quality of the hardware we got into this box. So much so, we can unabashedly say that this PC can stand up to damn near any task. Read on to find out what parts we picked, why we picked them, and why there's never been a better time to assemble your own no-compromises PC on a budget.

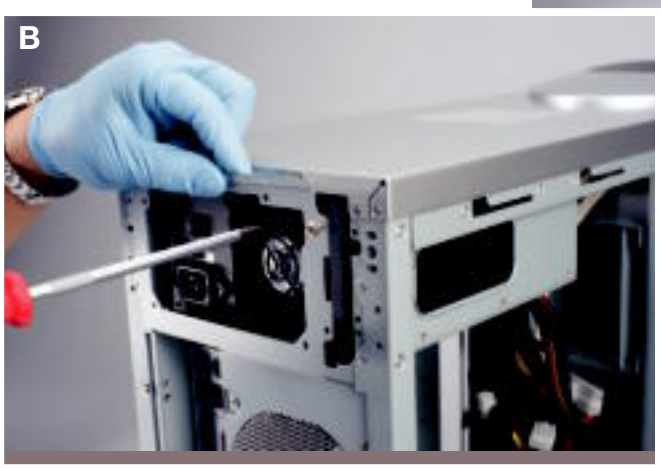
BY GORDON MAH UNG

READY, SET, BUILD

Once you've collected all your parts, you're just 13 steps away from a hand-built PC you can be proud of

1 MOUNT THE POWER SUPPLY

Cooler Master's big CM Stacker gives you options for PSU placement. You can mount it in the traditional spot up top or place it below the motherboard. We're sticking with tradition here. First, remove the back plate covering the PSU slot by



removing the two screws that hold it in place. Then carefully slide the PSU in place (fan side down), pushing the wire bundle from the PSU through the front of the cage (image A). Now attach one of the Stacker's two included PSU brackets to the case (image B). The PSU will mount to this bracket. Oddly, the supplied bracket lets you attach the supply with only two screws, but that's generally good enough.

2 INSTALL THE OPTICAL DRIVE

To install the optical drive, remove both the left and right sides of the case. Inside the case, you'll see a row of quick-release latches that hold the drives in place. Open the latches at the spot where you want to insert your drive. Now remove the bezel from the slot on the front of the case where your drive face will be. (While you're at it, you should also remove the three lower bezels that block access to the hard-drive cage.) The CM Stacker uses a quick-release rail system to mount optical drives. Find two plastic rails in the case parts box (they should be marked Right and Left) and attach each to the appropriate side of the optical drive (image A). The rails do not screw into the drive, so don't bother trying. Now slide the drive into its slot in the case and flip the quick-release levers (image B).

PARTS AND PRICE LIST

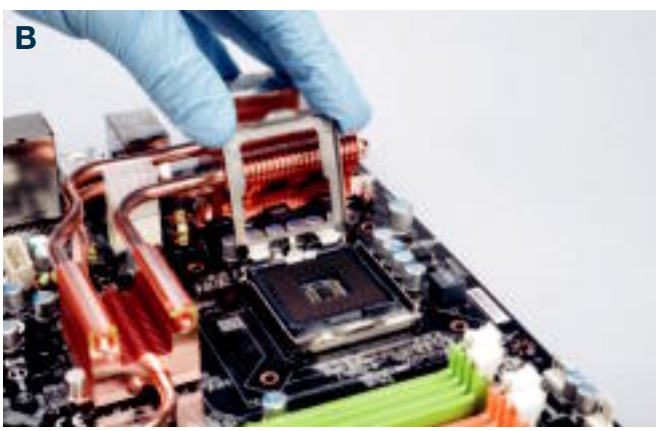
- **Videocard**
  XFX GeForce 8800 GTS 512 Alpha Dog Edition
  $350, www.xfxforce.com
- **Motherboard**
  MSI P35 Neo2-FR
  $120, www.msi.com.tw
- **CPU**
  Intel Core 2 Quad Q6600
  $275, www.intel.com
- **Memory**
  Patriot 4GB DDR2/800
  $120, www.patriotmem.com
- **Case**
  Cooler Master CM Stacker STC-T01-UW
  $120, www.coolermaster.com
- **Power Supply**
  PC Power & Cooling Silencer 610
  $120, www.pcpower.com
- **Operating System**
  Windows XP Professional
  $100, www.microsoft.com
- **Hard Drive**
  Seagate 750GB Barracuda AS 7200.10
  $184, www.seagate.com
- **Optical Drive**
  Optiarc AD-7190A
  $25, www.sonynec-optiarc.com
- **Soundcard**
  Creative Labs Sound Blaster X-Fi Xtreme Gamer
  $80, www.soundblaster.com

3 INSTALL THE CPU

Installing the CPU is the most delicate operation you'll perform when building your system. If you're a ham-fisted tyro or you've got the coffee shakes really bad, get someone who's more deft to install your proc rather than risk destroying your motherboard. First, remove the protective plastic shield covering the socket on your motherboard (image A). Set this cover aside in case you need to return the board (or store it). Many manufacturers will not take back a board without this plastic shield in place. Now unclip the metal arm alongside the socket and flip out the load plate (image B). To install the proc, match the two notches in the CPU with the tabs in the socket. Grasp the CPU with two fingers and carefully lower it straight into the socket while keeping it parallel to the plane of the socket (image C). Do not drop one side first and do not slide the CPU around in the socket, as you could bend the pins and kill your mobo.

A

B



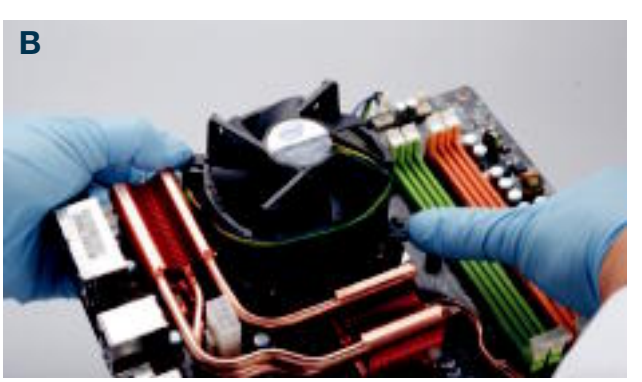
C

4 ADD CPU COOLING

We chose a retail CPU package, which provides a stock Intel cooler. Although Intel ships different coolers with its CPUs, even the lowly Intel Core 2 Quad Q6600 comes with a fairly decent model. It's quiet, efficient, and easy to install. A brand-spanking-new heatsink should have thermal past pre-applied to it (image A). To install the heatsink, match the four legs with the holes in the motherboard and gently push them in. Each leg's locking mechanism should be in its install position out of the box, with the arrows facing out. Lock each leg into place by pushing on the locking mechanism until it catches, using a cross-star pattern (image B). To verify that you've done it correctly, flip the motherboard upside down. You should see the four legs protruding slightly through the bottom. If one is not locked in place, turn the locking mechanism counterclockwise—so the arrow faces in (you may need to use a slotted screwdriver to do this). Pull the leg straight up, turn it clockwise, and try again. Now plug the four-pin power cable into the four-pin mobo header labeled "CPU fan."

A

B



5 RAM IT HOME

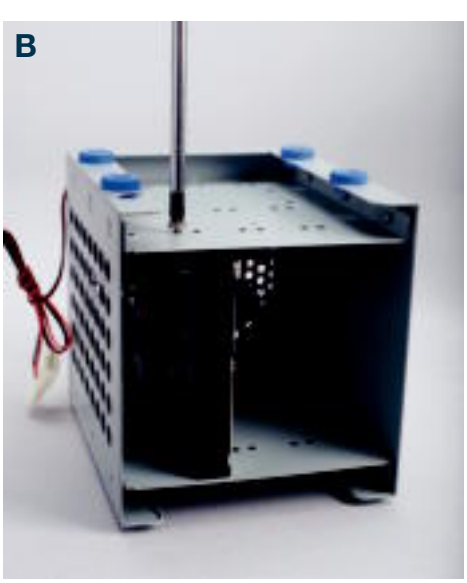
You'll get the most performance out of your PC by installing RAM in dual-channel mode. The method for doing this varies among motherboard brands. On the MSI board, dual-channel mode requires that you put one stick in an orange slot and the second stick in a green slot.

Place the board on a flat, stable surface. Put your antistatic bag beneath the board if you don't have a good static-free work area. Next, locate the notch on the RAM and match it with the notch

in the slot (image A). Pop the arms open for the slot you'll be filling, put your fingers on the ends of the module, and gently push the RAM in place until the arms lock into position (image B). If the RAM doesn't go in, double-check that the notches line up and try again. When you're done, make sure the arms that hold the RAM in are in their closed position. If they are extended, they could impede your GPU or even damage it.

6 CAGE THE DRIVE

Installing the hard drive is a straightforward process. But first getting to the hard drive cage in the CM Stacker is another matter. To get the cage out, unlock the quick-release arms on the left and right sides of the case. Pull the cage straight out. To get to the screws that you'll use



to mount the drive, pull the side plates off of the cage. They're held there by simple friction and will come loose with just a slight amount of pressure (image A). Now, as you have done for the last 20 years, use four coarse screws to mount the hard drive in place (image B). Put both sides of the drive cage back on (along with the drive rails), and slide the cage back into the case. Push the bezels in place, lock the arms in place, and you're done! With the hard drive, anyway.

WHY WE CHOSE

4GB Patriot DDR2/800 RAM

One of the glaring weaknesses with last year's $1,500 PC was RAM. With RAM prices through the roof at that time, all we could afford was 1GB of DDR2/800. Well, what a difference a year makes. While 1GB cost $150 last year, we were able to buy 4GB of Patriot DDR2/800 RAM for $120 this go-round. And that's without the rebate, which brought the price down to $80

Why Patriot RAM? At this price, it's all about bang for the buck, and after surfing the online stores, we picked the Patriot modules because they offer slightly better-rated latency for about the same cost as the competition.

Our RAM configuration isn't that simple, though. Although the board posts just fine with 4GB, running a 32-bit Windows OS doesn't quite give you full access to the RAM. Check Windows XP and it'll report only 3.25GB free. So is the other .75GB wasted? Not quite. It's a complicated issue, but Microsoft argues that even if the applications cannot use all 4GB of RAM, the OS, and even the drivers, will, so the additional headroom does help.

All we know is that we're happy to quadruple our RAM footprint for less money than we spent last year. Now that's progress.

$1,500 PC

7 MOUNT THE MOTHERBOARD

Before you can mount the mobo, you must install the I/O shield—that little metal plate that frames all the inputs and outputs on the back of your case. The shield should have come with your mobo. If it didn't, you'll have to contact the maker for a replacement or mount

the board commando. Use the butt of your screwdriver to pop out the shield that came with the case. Now take the shield that came with your board and pop out the squares for the necessary ports. Make sure the grounding arms for the Ethernet, eSATA, and PS/2 ports are bent in toward the case's interior (image A). Otherwise, they'll get tangled in the ports when you install the board.

Next, find the bag of brass motherboard standoffs that came with the case. Install these in the case, making sure you have one for each mounting hole in the motherboard. Use pliers to torque them down enough so they don't back out should you need to remove the mobo (image B). Take note of how many mounts you installed. The typical number is nine. Now drop the board in and screw it down (image C). Use just enough force to keep the screws from backing out, but not enough force to crush the PCB.

8 DROP IN THE GPU

Our MSI board hosts two physical x16 PCI-E slots. We say "physical" because only one actually operates at x16 data rates. That's the one closest to the CPU. We'll want to use that slot for our GPU to get the best performance out of it (image A). Before you install the card, remove the two expansion slot covers from the rear of the case where the card's ports will emerge. You can toss the covers or keep them as

WHY WE CHOSE

Intel's Core 2 2.4GHz Quad Q6600 CPU

We briefly toyed with the idea of using AMD's new Phenom quad core for this year's $1,500 PC. After all, AMD has priced the new CPU quite attractively. There's also an argument for the forward-looking upgradability of the AM2 platform. In the end, however, we decided to go with Intel since its performance roadmap is unquestionable right now.

We're a little nervous about where AMD is headed. The company seems to change direction each quarter and is again delaying the release of Phenom 9900, so it's safer to go with Intel. And it doesn't get any safer than the Core 2 2.4GHz Quad Q6600 CPU. Our chip is a Rev G0, so it will overclock well to boot!

Last year, we overclocked a dual-core proc, and we considered that option for about a second this year. But enough applications now take advantage of four cores, so we felt compelled to go quad with this year's box. We also like that it gives us a roadmap to the company's 45nm CPUs. This also helped us decide which motherboard/chipset to use (see the sidebar on page 26).

In a nutshell, we see Intel's 45nm Penryn processors as the future for Intel. We figure we'll run the Q6600 for another 12 to 18 months and then see what cheap goodness Intel can bring us after that. Heck, by that time, we'll probably be able to buy a 3.66GHz Penryn for $250.

back scratchers. When you put the card in, make sure it is firmly in place with all of the contacts securely in the PCI-E slot (image B). A common error is to insert the card so the contacts sit just outside the slot. Another common error is for the contacts to not make a complete connection with the slot. This is usually the result of a bent case enclosure causing a gap between the card and the case. You can sometimes fix the problem by bending the case back in place. Now use the two thumbscrews that had held the expansion slot covers to screw the card in place.

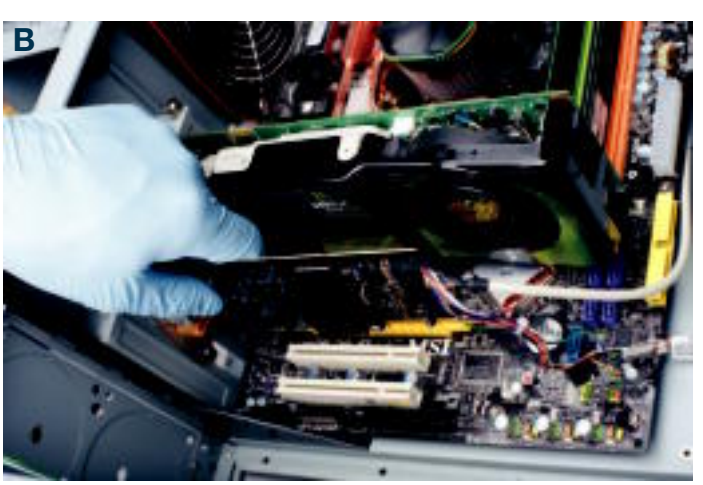
B

9 INSTALL THE SOUNDCARD

We didn't have to forgo discrete audio this year, so we reached for a budget X-Fi card. There are two options at this price range, but only one is really worthy of being called an X-Fi: the XtremeGamer. Its cousin, the XtremeAudio, doesn't actually feature a full X-Fi chip and does not support EAX 5. One thing Creative did right with the XtremeGamer is include a standard front-panel audio header on the card. This lets you use the front headphone and microphone jacks. Grab the CM Stacker cable labeled "AC97, HD Audio." Insert the plug labeled "HD Audio" into the header on the card—it's keyed and should fit only one way (image A). Now remove the expansion slot cover from the back of the case where the card's ports rest and firmly insert the card into a PCI slot (image B). As with the GPU, make sure the card is firmly in place and that all of the contacts are connecting. Screw the card in place and you're good to go.

A

B



WHY WE CHOSE

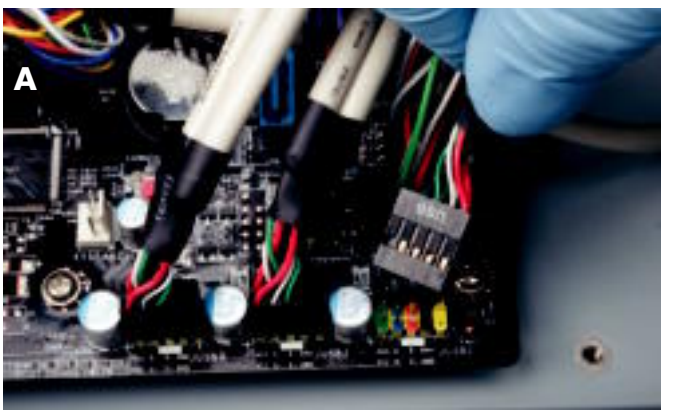
MSI'S P35 Neo2-FR Motherboard

Once we decided to go with Intel, we had a hard time selecting a chipset/motherboard combination. We would have liked to have run an Nvidia chipset, which would have given us an option to run SLI down the road, but the current situation with Nvidia's chipsets is a bit murky. The still-stellar nForce 680i chipset (at least for boards currently available) has issues running Intel's 45nm Penryn CPUs in quad-core trim. In fact, the combination doesn't work at all for unfathomable reasons. Boards using the new nForce 780i chipset do work with quads, but they're ultra expensive. In the end, we decided that Intel's P35 platform made more sense for our needs. It supports the company's 45nm parts and Intel chipsets are rock-solid—you don't have to worry about any of the teething pains third-party chipsets experience, especially with new CPUs.

For our board, we selected MSI's P35 Neo2-FR. It's a budget board, but it's not totally strippo. It has eSATA ports, features MSI's excellent automatic driver and BIOS update service, and runs up to 8GB of RAM. OK, maybe it's a little strippo, but when it posted on the first boot and didn't give us any troubles, we weren't complaining.

10 CONNECT THE UMBILICAL CORDS

The CM Stacker comes with a generous six front-mounted USB ports. Fortunately, the MSI P35 Neo 2–FR has enough USB headers to run them. To connect them, find the three USB cables in the Stacker case. Each is keyed, so they cannot be installed incorrectly. Plug them into the JUSB1, JUSB2, and JUSB3 mobo headers (image A). Now use the SATA cable that came with the mobo to attach your hard drive. Simply plug one end into an available purple port on the mobo and plug the other end into the drive (image B). One caveat: A SATA connector is delicate. Once you have it in place, do not put pressure on it or you may snap it; this can be fatal, especially if you snap the connector on the drive. You might notice that one of our budget board's flaws is the inconveniently located SATA ports. With a long GPU in place, two of the SATA ports are blocked. You can get around this by purchasing a right-angle SATA cable, but that will work for only one of the ports. Fortunately, there's an additional SATA port, and you'll find two eSATA ports on the back of the motherboard. Now get the IDE ribbon cable that came with your mobo and use it to attach your optical drive—there's only one slot on the motherboard into which it can fit.


A

B

11 FINISH OFF THE FRONT PANEL

Remember in *Kung Fu* how Caine had to grab a pebble from the old man's hand to prove how badass he was? Well, installing a computer's front-panel connectors is kind of like that. Only after years of study and apprenticeship will you be able to plug in the front-panel connectors without getting it wrong at least once. Nevertheless, we'll try to do it right here. Grab the rainbow cable with the Power SW, HDD LED, Reset SW, and Power LED connectors and take a close look at the front-panel header. You'll notice that the yellow header is color-coded and also features a plus symbol on the positive connector (image A). The motherboard manual will spell out where each cable goes, but since the board follows the Intel FP connector standard, we know that the power switch connects to black, the power LED connects to green, reset goes to blue, and the hard drive LED goes to red. The orientation of the power-on and reset switches don't matter, but you'll have to match the positive and negative with the LED indicators. If you do it wrong, don't worry; there's no risk of destroying anything. We got it right on the first shot, however, because our kung fu is that strong (image B).

A

B

12 ADD POWER TO ALL PARTS

You're in the final stretch. The penultimate chore is to power up all the components. One feature of our $1,500 rig we're particularly happy with is the PC Power & Cooling power supply. Usually, one of the first compromises you make when building a budget box is with the PSU. The Silencer 610 is quiet and gives us reliable power output under all conditions. We can't say that about other inexpensive power supplies, some of which have faded on us after 18 months of duty.

First, make sure the PSU is not connected to the wall socket. Now, begin by plugging the main power connector into the motherboard (image A). This 24-pin connector is keyed and cannot be inserted incorrectly. You should hear a soft click as it locks in place. Make sure it's firmly in place—double-check by gently trying to pull out the connector. A common building error is to have the plug just slightly off kilter, which will cause booting problems or a failure to boot at all. Now grab the eight-pin ATX power connector. You'll plug this into a socket on the mobo, southeast of the CPU (image B). Failure to plug this in is another common error, which will also cause the system not to boot. Next up is the GPU's power. The PSU includes one cable with a six-pin connector, and another with a dual six/eight-pin connector. You can use either, but we opted for the six-pin, as it looks neater. The pin will click into place in the back of the GeForce 8800 GTS 512 board (image C). Now plug the power cables into the SATA drive and the optical drive. OK, you're done with the hardware; it's time to turn this suckah on!

WHY WE CHOSE

Nvidia's GeForce 8800 GTS 512

Trying to configure a new PC can be a massive mind bender. You'll have to not only figure out what CPU you want and what CPU you're going to eventually upgrade to but also factor in the GPU choice and its potential upgrade path.

We originally considered Nvidia's stupendously cheap and fast GeForce 8800 GT card. When our budget allowed us to step up, we reached for the GeForce 8800 GTS 512 model. Mind you, that's the new, faster GTS, not the older one. In the end, we decided that having the single fastest card we could afford today made more sense than factoring in an SLI upgrade.

As much as we love SLI, its utility is best left for ultra-high-resolution gaming. And then there's the fact that it doesn't actually run faster until the drivers are updated for the games. That's always been a problem for dual-GPU configurations in the past.

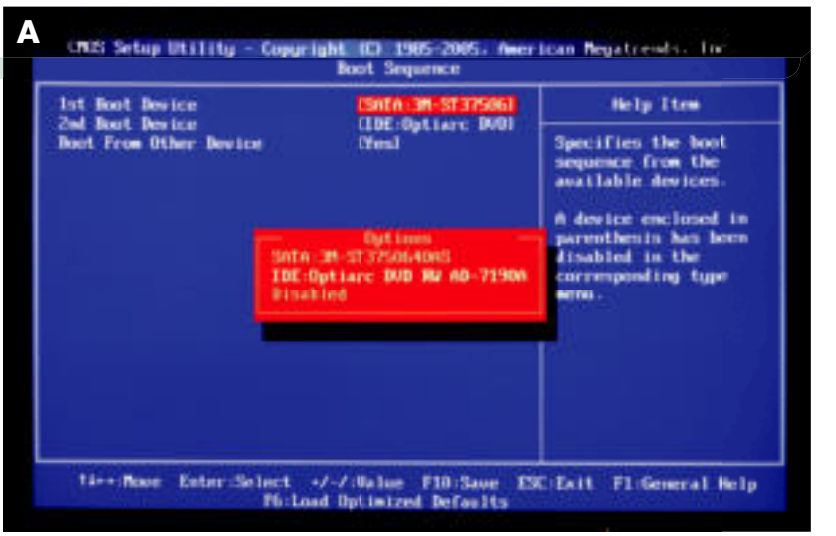
No, as sexy as it is to pack multiple cards, we think it actually makes more sense for a budget buyer to buy one very fast card. In 18 months, when it's time to upgrade again, your money is better spent buying the fastest new-generation card, which will likely be faster than your older card in SLI mode.

$1,500 PC

13 INSTALL THE OS

Here's a rule when building a system: Never put the sides back on the case until everything is running smoothly. Otherwise, you'll anger the PC building gods, who will punish you with a no-POST condition. Flip your system upright, make sure no cables are jammed in the fans, and plug the puppy in. Plug in your monitor, keyboard, and mouse and hit the power button. If you followed our instructions to the letter, your PC should boot with no problems. If nothing happens, here's a quick checklist: Is the PSU's power switch turned on? Is the power strip you're plugged into turned on? Is the videocard properly seated? Is the RAM firmly inserted? How about the 24-pin main power connector and the eight-pin power connector? And, finally, are you sure you wired up the front-panel connector correctly? Perhaps you mixed up the power switch and the reset switch.

A



Assuming everything is working now, it's time to configure the BIOS. You'll need to hit F1 during boot and go into Advanced BIOS Features > Boot Sequence to change the boot order to the optical drive (image A). If you don't see the hard drive listed by model, your SATA drive is likely either not powered or not plugged into the correct port or the data cable is loose. While you're in the Advanced BIOS Features section, you should also disable boot sector virus protection or the BIOS will confuse your OS install as a virus. Also go into the Integrated Peripherals section and disable the HD Audio since we're packing an X-Fi.

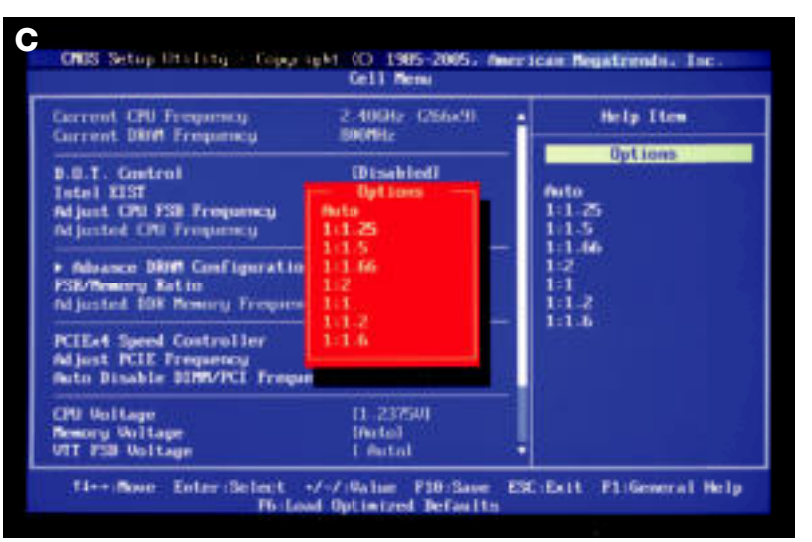
Drop your XP disc into the optical drive and reboot. Hit the space bar when prompted and follow the Microsoft questions to get the OS up and running. Now install your motherboard, GPU, and soundcard drivers from the discs that came with those parts. Once that's done, it's time to overclock.

Reboot and go back into the BIOS—MSI lets you overclock automatically through a Windows application, but we prefer the old-fashioned method. Go into the Cell Menu section. Under Adjust CPU FSB Frequency, you should see the default setting of 266MHz. Raise it by 5MHz or 10MHz increments at a time until the system becomes unstable, then gradually back it down to its maximum stable speed. To get to even higher clock speeds, you'll also have to add more voltage to the CPU. We set our Rev G0 Q6600's FSB at a conservative 310MHz, which gave us 2.8GHz, or a 400MHz overclock (image B). To increase voltage to the CPU, select CPU Voltage from the BIOS menu. Use the plus and minus keys to make adjustments. We set ours at 1.4 volts, which isn't too dangerous to the health of the chip. Your overclock will also OC the RAM. If you want to keep the RAM within spec, you can change the FSB/Memory Ratio setting. We set ours to 1/1.25, which ran our DDR2 at 775MHz (image C).

Reboot and run a stress test such as Prime95 (**www.mersenne.org/freesoft.htm**) or 3DMark06 (**www.futuremark.com/**) to determine if your overclock is stable or not.

B

C



THE NO-COMPROMISES

Peripheral Vision

We plan to pair these budget parts with our new PC

MONITOR: While we generally prefer the size and screen quality of larger LCD monitors, there's no denying that 22-inch models offer great value. From this class, we've chosen the HP w2207 (reviewed June 2007). It has an attractive cabinet, ergo adjustments, built-in USB ports, HDCP support, and a glossy screen that adds dazzle to any picture.
$330 (street), www.hp.com

KEYBOARD: Our keyboard of choice these days, at least for ergo aficionados, is the Microsoft Natural Ergonomic Keyboard 4000. Its down-tilting design will protect you from RSI but still deliver a great typing experience. If ergo isn't your bag, pick up whatever Keytronic board you can find for $15.
$35 (street), www.microsoft.com/hardware

MOUSE: Our favorite rodent remains the Logitech G5 rev. 2. This laser optical mouse sports the same sensor and feature list as the original G5, but it adds a second thumb button. With an adjustable sensitivity sensor, a variable weight configuration, and an extremely comfortable grip, this beauty is worth every penny.
$50, www.logitech.com

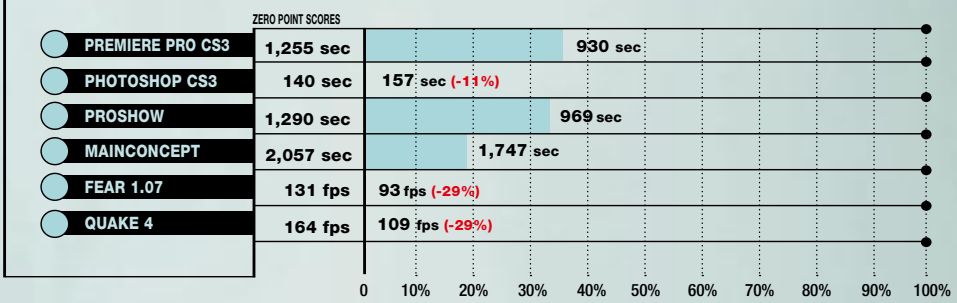
PC IN ACTION

We don't want just a smooth-running rig—we want a machine with benchmark numbers we can brag about!

To test the mettle of our $1,500 creation, we benched it against our standard zero-point system (which cost twice as much to build). The results? Pretty damned good. In the CPU-dependent tasks, our mildly overclocked 2.8GHz quad core outran the stock 2.67GHz Core 2 Quad Q6700 in Adobe Premiere Pro CS3, Photodex ProShow Producer, and MainConcept Reference. All three tests are optimized for four cores and favor high clocks. In Photoshop CS3, however, our $1,500 rig was about 11 percent slower despite the slight clock-speed advantage. Why? Photoshop CS3 likes fast hard drives. While the 750GB Seagate is a fine performer, the zero-point's single 10,000rpm 150GB WD Raptor is able to nullify the $1,500 PC's RAM and CPU advantage.

We didn't expect any wins in gaming—and we didn't get any. Our zero-point machine packs two GeForce 8800 GTX cards in SLI mode. There's just no way a single GeForce 8800 GTS 512 can beat those odds. Still, our $1,500 PC performed better than you might expect. The SLI 8800 GTX cards were roughly 30 percent faster in gaming, which isn't a complete beat down. Of course, it helps that our current gaming benchmark tests are conducted at 1600x1200 resolution. At a much higher resolution of, say, 2560x1600, the SLI cards would whale on our singleton. But then again, how many budget buyers are going to pair an $1,800 monitor with a $1,500 box? The upshot is that we're pleased as punch with our $1,500 PC's performance.

XP PRO BENCHMARKS



Our current desktop test bed consists of a quad-core 2.67GHz Intel Core 2 Quad Q6700, 2GB of Corsair DDR2/800 RAM on an EVGA 680 SLI motherboard, two EVGA GeForce 8800 GTX cards in SLI mode, a Western Digital 150GB Raptor, a 500GB Caviar hard drive, an LG GGC-H20L optical drive, a Sound Blaster X-Fi soundcard, and a PC Power and Cooling Silencer 750 Quad. The OS is Windows XP Pro.

The Technology Treadmill

Sometimes the rapid pace of progress works in your favor, sometimes it doesn't

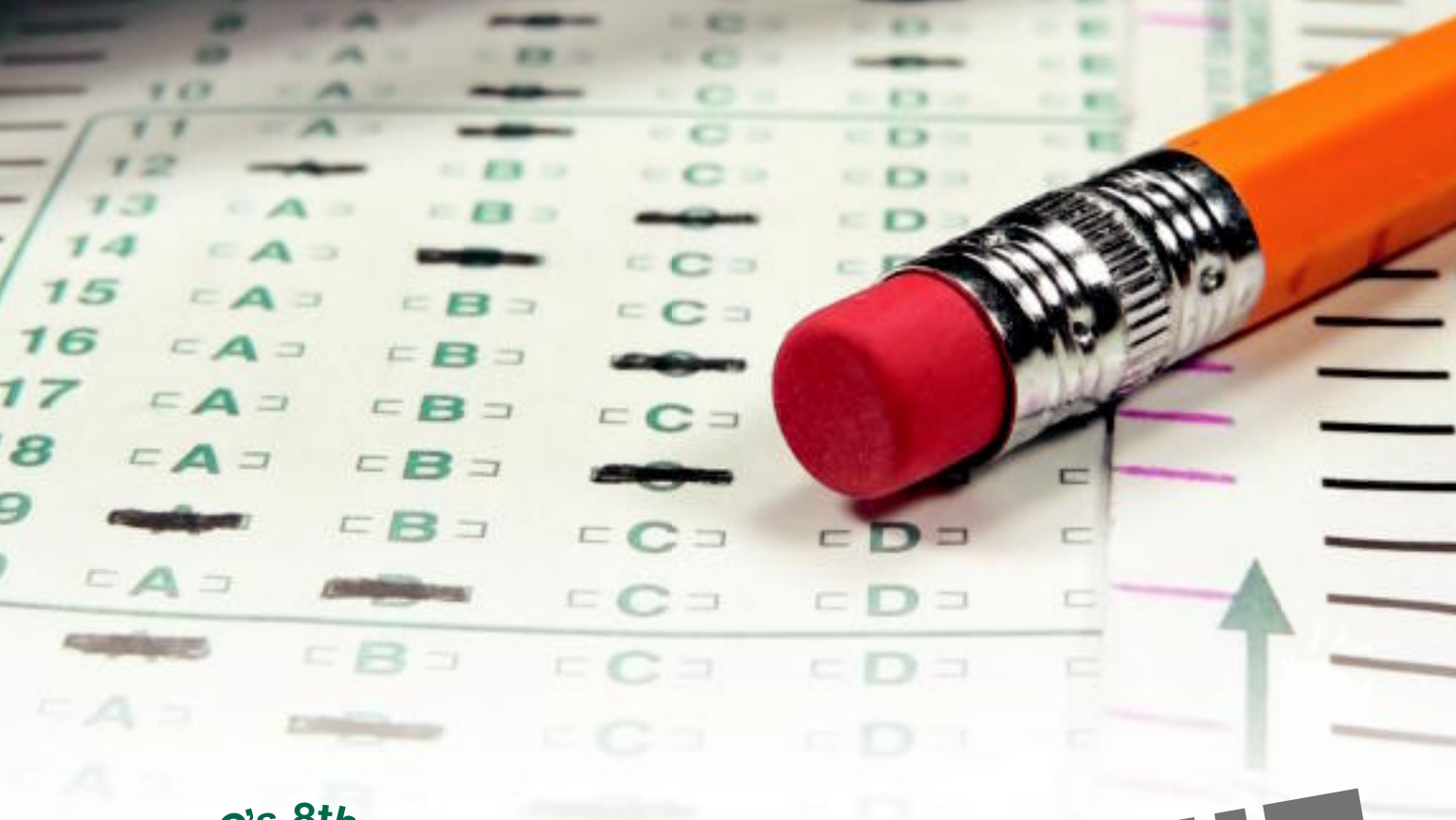
Bemoan the technology treadmill all you want, but there are times when a power user can really take advantage of the ever-fluctuating landscape. Last year's $1,500 PC was a decent machine for its time, but it had a few fatal flaws: a tiny hard drive, criminally meager RAM, and onboard audio. Sure, we had a DX10 card, but the aforementioned compromises haunted us for a whole year. This time, we wanted to avoid such trade-offs, so we sought to make every penny count. And as it turned out, the treadmill worked for us. While 1GB of RAM cost us $150 last year, we were able to score four times the memory this year for $120 ($80 if you count the rebate). We also decided that there was no way in hell we would settle for a hard drive capacity that laptops can surpass. With the vast stores of video, music, and photos most of us own, not to mention all the other crap, Seagate's 750GB seemed like a far wiser choice than last year's 250GB number.

When you directly compare the budget breakdown of last year's $1,500 PC against this year's, it's easy to see why there's so little love between Intel and Nvidia. Last year, 30 percent of the PC's total cost went to the GPU. This year, the GPU takes up just 24 percent of the budget, but that still outstrips the 18 percent that went to the CPU—a quad core, no less.

Last year, the puny 1GB of RAM ate up 10 percent of our total budget. This year, with quadruple the amount, RAM accounts for just 8 percent of our costs (sans rebate, mind you). In other words, it's ugly to be in the RAM business right now.

The prices of the OS, PSU, case, and optical drive were pretty much static, but we did lower our motherboard bill. Last year, we shelled out for a high-end 680i, while this year a mid-range P35 board fulfilled our needs.

The short story is that the treadmill was our friend this year, getting us way more machine for the money. MPC



Maximum PC's 8th Annual

GEEK QUIZ

It's time to put your PC schooling to the ultimate test. Hope you studied!

BY THE MAXIMUM PC STAFF

Geeks. We can go about our day unnoticed, quietly making sure the systems that allow the workplace to operate efficiently continue to run. Some people might consider us downright dull—and that's just fine by us. Because when something out of the ordinary happens—when a car appears in someone's office, a cubicle is transformed into a fish tank, or livestock roams the halls—we manage to fly right under the radar, and thus remain free to commit evermore elaborate shows of ingenuity without reproach.

In addition to testing your tech knowledge, this year's Geek Quiz celebrates the best geek pranks of all time, which, unlike baser schoolyard antics such as swirlies and wet willies, showcase intelligence, skill, and guile. If you think you've topped the ones we've listed here, be sure to contact us at input@maximumpc.com.

1 **DisplayLink is**

- A. A spec that allows monitors to communicate with each other
- B. The new high-bandwidth replacement for HDMI
- C. The new high-bandwidth replacement for DVI
- D. A USB-based monitor connection spec

2 **A knol is**

- A. A proprietary "unit of knowledge"
- B. A wolf-like monster in D&D-based role-playing games
- C. The opposite of a fjord
- D. A grassy area

3 **The largest 2.5-inch notebook drive you can currently purchase is**

- A. 250GB
- B. 320GB
- C. 500GB
- D. 1TB

4 **Which of the following statements is true of IEEE 802.11n as of January 31, 2008?**

- A. It is a fully ratified IEEE standard for wireless networking
- B. It relies on MIMO (multiple input/multiple output) technology
- C. Routers based on the 802.11n standard must have three antennae
- D. You can boost an 802.11n router's range by adding one powered antenna

5 **GLaDOS is**

- A. A DOS emulator used for old-school gaming on the Windows operating system
- B. A program that blends an OpenGL GUI into a command-line file structure
- C. An emerging file format for increasing the compression factor of photographs
- D. A homicidal maniac

6 **Which is NOT correct?**

- A. USB 3.0 = 4.8Gb/s
- B. FireWire S3200 = 5.0Gb/s
- C. Third-gen SATA = 6.0Gb/s
- D. All of the above

7 **Which of these is not a battery type used in modern consumer electronics?**

- A. Li-Ion
- B. NiMh
- C. Alkaline
- D. H-Fusion

8 **DisplayPort is to DisplayMate as**

- A. eSATA is to HDTach
- B. DVI is to Dual-Link
- C. USB is to PCI-Express 16x
- D. PS/2 is to DisplayLink

9 **At what frequency does 802.11n operate?**

- A. 2.4GHz
- B. 5.0GHz
- C. 700MHz
- D. Either a or b

10 **HDV can record to miniDV tape at up to what resolution?**

- A. 1440x1080
- B. 1920x1080
- C. 1920x1200
- D. 2560x1600

11 **Windows Home Server software lacks which functionality out of the box?**

- A. Automatic server backup
- B. Automatic client backup
- C. Music and video sharing
- D. Redundant data storage

12 **I am not fully functional on 64-bit Windows Vista**

- A. Adobe Photoshop
- B. Peggle Extreme
- C. GameTap
- D. A and C

13 **What is this?**

- A. A spent fuel cell
- B. A collection of mouse weights
- C. Eight N-cell batteries
- D. Jefferies tubes

14 **How many capture points are on the Dustbowl TF2 map?**

- A. Two
- B. Four
- C. Five
- D. Six

Answers → 1-d, 2-a, 3-c, 4-b, 5-d, 6-b, 7-d, 8-a, 9-d, 10-a, 11-a, 12-c, 13-b, 14-d

GEEK QUIZ

15 How many platters did the first 1TB drive sport?

- A Three
- B Four
- C Five
- D Nine

16 Which chipset is compatible with Intel's 1,600MHz FSB Core 2 Extreme QX9770?

- A nForce 680i
- B Intel x48
- C Intel 955X
- D AMD 790X

17 The name of AMD's new CPU, Phenom, refers to

- A John Phenom, AMD's first engineer, who died in a Segway collision
- B The city of Phenom, located just outside Austin, Texas
- C A tributary that flows into the Orinoco river
- D AMD's belief that the chip is phenomenal

18 A single-rail power supply

- A Uses a single quick-release rail to attach the supply to the case enclosure
- B Follows the new Thomas Technology eXtended (TTX) spec for use in single-board computer systems
- C Delivers all of its 12-volt power on one rail instead of multiple rails
- D Is an older standard that has been supplanted by multirail power supplies

19 PCI Express 2.0 doubles the

- A Data rate of PCI-E
- B Length of the connector of the PCI Express 1.0 slot to support x32 cards
- C Power to the slot from 50 watts to 100 watts
- D Speed of PCI-E from 500MB/s to 1000MB/s

20 How many megahertz do you have if you add a Phenom 9900 to a Core 2 Duo Q6600 and subtract a Pentium Extreme Edition 955?

- A 1,000MHz
- B 1,267MHz
- C 1,333MHz
- D 2,666MHz

21 In this Intel-standard front-panel header, which jumpers plug into the reset switch?

- A Red
- B Blue
- C Yellow
- D Green

22 The average amount paid for Radiohead's name-your-own-price download of *In Rainbows* in the U.S.

- A $6
- B $10
- C $7.25
- D $8

23 Which technology increases the color gamut on LCD displays?

- A LED backlighting
- B Wide cold-cathode fluorescent lighting
- C Frame-rate control
- D All of the above

PHOTO COURTESY OF CALTECH

GREATEST GEEK PRANKS

CALTECH EARNS A SPOT IN THE ROSE BOWL

Caltech faculty and alumni have received 49 National Medals of Science, 32 Nobel Prizes, and 10 National Medals of Technology, but not a single Heisman Trophy. However, Caltech students *have* made their mark on the gridiron—at the 1961 Rose Bowl, in particular, which is now better remembered for this prank than the eventual outcome of the game (Washington 17, Minnesota 7, in case you were curious).

Rose Bowl halftime festivities that year included an elaborate flip-card routine organized by Washington's cheerleaders. To put their own stamp on the proceedings, Caltech students stole a copy of the instruction sheet and, working through the night, rewrote the instructions, made thousands of copies, artificially aged them, and then swapped them out for the originals.

The routine began as expected, but the eleventh display showed what appeared to be a beaver, the next spelled "Washington" backwards, and the penultimate display read "CALTECH." The cheerleaders decided not to see what was on the final card (legend has it the Caltech students left it untouched).

We could easily have filled this article with only Caltech pranks, but this one stands out for both its audacity and the number of times it has been reproduced by students at other schools—though never to such spectacular effect.

Answers → 15-c, 16-b, 17-d, 18-c, 19-a, 20-b, 21-b, 22-d, 23-d

GEEK QUIZ

24 The most recent 700MHz auction covers spectrum previously used by

- A Short-wave radio
- B VHF TV frequencies
- C UHF TV frequencies
- D Vulcans

25 At launch, the highest available clock speed for Phenom was

- A 2.3GHz
- B 2.4GHz
- C 2.5GHz
- D 1.2 jigawatts

26 Which of the following was NOT listed as one of *Maximum PC*'s 100 greatest tech inventions of all time?

- A HP Laserjet II
- B Zip drive
- C Eudora
- D 386 Enhanced mode

27 As of February 1, 2008, which studio's HD releases are exclusively in the HD DVD format?

- A Sony
- B Miramax
- C Pixar
- D Paramount

28 Which hardware spec mandates Internet connectivity?

- A DisplayPort
- B WiMax
- C HD DVD
- D 802.11n

29 This four-drive RAID configuration offers the fastest speeds

- A RAID 0
- B RAID 1
- C RAID 1+0
- D RAID 5

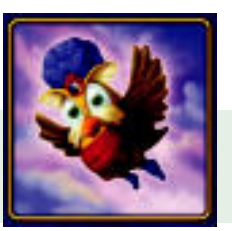
30 GSM stands for

- A Gateway Stabilization Modifier
- B Global Standard for Mobile devices
- C Global System for Mobile communications
- D Graphical System Macro

31 NAND and NOR refer to

- A Data-mapping methods
- B External peripheral connectors
- C Types of video codecs
- D CPU power-dissipation methods

32 This is an image of



- A Swami Bird
- B Master Hu
- C Woody Owl
- D Mr. Hoot

GREATEST GEEK PRANKS

DRESSING UP THE DOME

Only MIT students can challenge Caltech students' pranking skills (which our East Coast brethren prefer to call "hacks") and choosing just one to single out was a challenge. While affixing a Halo Spartan helmet and assault rifle to a statue of John Harvard in Harvard Yard is something to be celebrated, the myriad ways students have found to decorate MIT's Great Dome is most impressive to us. Over the years, the dome has played host to a fire truck, propeller, police car, Zelda Triforce symbol, airplane, block of cheese, beanie, and telephone booth, but being traditionalists, our favorite remains the reincarnation of the dome as a larger-than-life R2-D2 (complete with instructions addressed to "Imperial drones" on how to take the droid apart).

PHOTO BY MANOLIS KELLIS

Answers → 24-c, 25-a, 26-a, 27-d, 28-c, 29-a, 30-c, 31-a, 32-b

GEEK QUIZ

33 **DisplayPort is unique among display interfaces because it**

- A Carries both audio and video signals
- B Supports HDCP
- C Serves as both an external and internal interface
- D Supports 10-bit color

34 **BD+ is**

- A A next-gen optical disc format
- B A programming language
- C The predecessor of BD++
- D A form of copy protection

35 **Lightweight Profiling refers to**

- A The use of carbon-fiber materials
- B An AMD hardware extension spec
- C Prejudice against newbs
- D A feature of the UMPC spec

36 **Apt-get is**

- A A *nix administration certification
- B A package-handling function for GNU/Linux
- C A Web 2.0 apartment-finding service
- D A DOS command

37 **HD DVD movies are cheaper than Blu-ray movies to manufacture because**

- A They involve standard DVD production processes
- B The spec has fewer features
- C They carry just one encryption license
- D All of the above

38 **Memory maker OCZ recently purchased**

- A Maingear
- B Overdrive
- C CyberPower
- D Hypersonic

39 **Which GPU vendors support stereoscopic imaging in their consumer device drivers?**

- A Nvidia
- B AMD/ATI
- C Via/S3
- D A and B

40 **Intel's follow-up to Penryn is code-named**

- A Bulldozer
- B Nineveh
- C Nehalem
- D Bethlehem

41 **The acronym OLED stands for**

- A Orthogonal Lithographic Emission Display
- B Organic Localized Electronic Device
- C Organic Light-Emitting Diode
- D Organically Loud Electronic Demagoguer

GREATEST GEEK PRANKS

STOPPING TRAFFIC

On February 5, 2001, Bay Area commuters were greeted by the sight of a Volkswagen Bug hanging off the side of the Golden Gate Bridge. Daring? Creative? Stupid? Yes to all of the above, but we must admit, the audacity of the prank is impressive. The California Highway Patrol, as one might expect, was not so amused. And while the exact perpetrators remain unknown, members of the University of British Columbia Engineering Undergraduate Society are known to have pulled off similar stunts elsewhere. By running a cable along the underside of

the bridge, the car, which had been stripped of its engine, wheels, and windows, was safely harnessed to the cable and hung without fear of damaging the bridge or the ship traffic below.

Answers → 33-c, 34-d, 35-b, 36-b, 37-a, 38-d, 39-a, **40-c, 41-c**

GEEK QUIZ

42 **This motherboard conforms to what formfactor?**

- A BTX
- B DTX
- C ITX
- D Micro ATX

43 **A GPS device relies on which of the following to perform real-time location tracking?**

- A Gnomes living beneath the surface of the earth
- B A system of satellites orbiting the earth
- C An antenna
- D B and C

44 **The Nvidia product code-name G92 refers to the technology in which of these products?**

- A GeForce 8800 GTS (512MB frame buffer)
- B GeForce 8800 GTS (640MB frame buffer)
- C GeForce 8800 GTS (320MB frame buffer)
- D GeForce 8800 Ultra (768MB frame buffer)

45 **What soundcard supports EAX Advanced HD 5.0?**

- A Auzentech X-Fi Prelude 7.1
- B Creative Labs X-Fi Xtreme Audio
- C Razor Barracuda AC-1
- D Asus Xonar D2

46 **Which of the following materials is NOT commonly used to build speaker enclosures?**

- A Steel
- B Medium-density fiberboard (MDF)
- C Ceramics
- D Plastic

47 **Ubuntu, which boasts the highest consumer install rate of any Linux distro, is based on**

- A Fedora
- B Debian
- C Slackware
- D Mandriva

48 **In the PC world, ESA now stands for**

- A Electronic Status Aggregator
- B Error-Stabilizing Architecture
- C Enhanced Storage Archive
- D Enthusiast System Architecture

49 **What type of product did Ray Dolby (of Dolby Laboratories) first invent?**

- A A noise-reduction filter for audio applications
- B A noise-reduction filter for video applications
- C A backlight technology for liquid-crystal displays
- D A multi-channel audio algorithm for surround sound

50 **Which of the following multi-GPU configurations is NOT viable?**

- A A 1GB Radeon 3870 X2 card paired with a 512MB Radeon 3870 card in any CrossFire motherboard
- B Three 8800 GT cards in an nForce 680i SLI motherboard
- C Three 8800 Ultra cards in an nForce 780i SLI motherboard
- D A GeForce 8500 GT paired with the onboard GPU on a GeForce 730a motherboard

GREATEST GEEK PRANKS

STATUE OF LIBERTY

PHOTOGRAPH BY JAY SALVO. COURTESY OF UNIVERSITY OF WISCONSIN-MADISON ARCHIVES

On a cold February morning in 1979, more than one University of Wisconsin student may have awoken and exclaimed, "You maniacs! You blew it up!", as they saw what appeared to be the Statue of Liberty emerge from a frozen Lake Mendota. Luckily, students weren't soon sharing Econ 1 with a bunch of damn dirty apes; instead, they were witnessing their student government's handiwork.

The previous year, two students, Jim Mallon and Leon Varjian, members of the Pail and Shovel party, won control of the student government, in part on the promise they would purchase the Statue of Liberty and ship it to Wisconsin. On that February morning, some may have believed the two fellows indeed followed through. In reality, the pair of students constructed a replica in a shop near campus and installed it at night.

This was too much for the more straight-laced members of the student body, and one night the replica burned to the ground. Not easily dissuaded, the following year, members of the Pail and Shovel party built an even larger replica—and fireproofed it. The photo above shows a 1996 re-creation of the original prank. MPC

Answers → 42-d, 43-d, 44-a, 45-a, 46-c, 47-b, 48-d, 49-b, 50-b

ROXIO VS. NERO

BY KATHERINE STEVENSON

The leading names in digital-media creation square off with new do-everything software suites. Should you care?

By now, anyone who knows their way around an optical disc drive knows the names Roxio and Nero. The two media-creation mavens have been on the scene since practically the dawn of CD-burning time. And through to today, inclusion of one or the other's software is de rigueur with the purchase of just about any retail PC or optical drive. Of course, the bundled software packages are but abbreviated versions of the full-on suites Roxio and Nero offer. The stand-alone packages go far beyond the basics of disc copying, burning, and playing—and that's never been more true than today.

In recent months Nero and Roxio have released new iterations of their respective media-creation suites and both are packed with enough features to challenge the commitment of even manic media-philes. Roxio Easy Media Creator 10 and Nero 8 Ultra have come out swinging with more media-creation capabilities than we know what to do with… literally. Still, we're willing to jump into the fray to figure it all out. We'll tell you how these two suites rate and help you decide whether it's worth upgrading from the software you're already using.

ILLUSTRATION BY ADAM BENTON

Nero 8 Ultra

A no-nonsense approach to excess

Nero's SmartStart front end doesn't take you to every Nero app by default, but you can easily add your favorites.

When you install Nero 8 Ultra, no fewer than 22 individual apps take up residence on your PC. Some cover very specific tasks, such as DriveSpeed (which, as you might guess, tests the speed of your drive). Others are much more ambitious, like Nero Home, a Media Center–like interface that serves as an entertainment hub for music and video playback, TV streaming and recording, and content sharing over a network, all via a large living-room-friendly interface. Newcomers to Nero will appreciate the SmartStart app, which installs with a desktop shortcut, and helps make sense of the mayhem by presenting a more manageable number of categories and common tasks, e.g., "Rip and Burn," that then lead you to a suitable app. It's helpful, but it's definitely geared toward newbs. For instance, when you choose to create an audio disc or copy data, SmartStart takes you to Nero Express rather than Burning ROM—the more powerful, feature-rich program.

Such concessions to novice users, however, are actually pretty minimal in Nero, especially when compared to Easy Media Creator 10. We appreciate a degree of assumed sophistication, but Nero is sometimes too sparse with information, leaving it up to users to hunt and peck their way around an unfamiliar app.

The meat and potatoes of the Nero suite are Burning ROM, Recode, and Vision. And these three applications are virtually unchanged from their Nero 7 versions in terms of functionality. That's a good thing, for the most part.

Burning ROM remains a one-stop shop for burning audio, video, and data to a CD or DVD, and we continue to appreciate its straightforward interface, reliability, and array of options. The app also supports burning data discs to HD DVD and Blu-ray media.

Recode would be the ideal format-conversion app if it offered support for more formats.

Recode is still the place to go for video conversion, such as when you want to compress the contents of a double-layer DVD into a file that will fit on a single-layer disc, or compress the latter into something better suited for a portable player. Recode does it well, keeping all the elements of the source material intact and offering a comforting degree of tweakability. You can, for instance, adjust the compression quality of all the secondary elements of a movie, such as menus and extras, in order to achieve higher quality in the main movie. And Nero's extensive list of "fit to target" options makes it easy to achieve the perfect amount of compression for a given device. A notable shortcoming of Recode, however, is its use of the Nero Digital file format. While this MPEG-4-based codec is compatible with a number of devices, it's no substitute for more open standards, such as DivX and Xvid. We couldn't, for example, stream a Nero Digital video file to our Xbox.

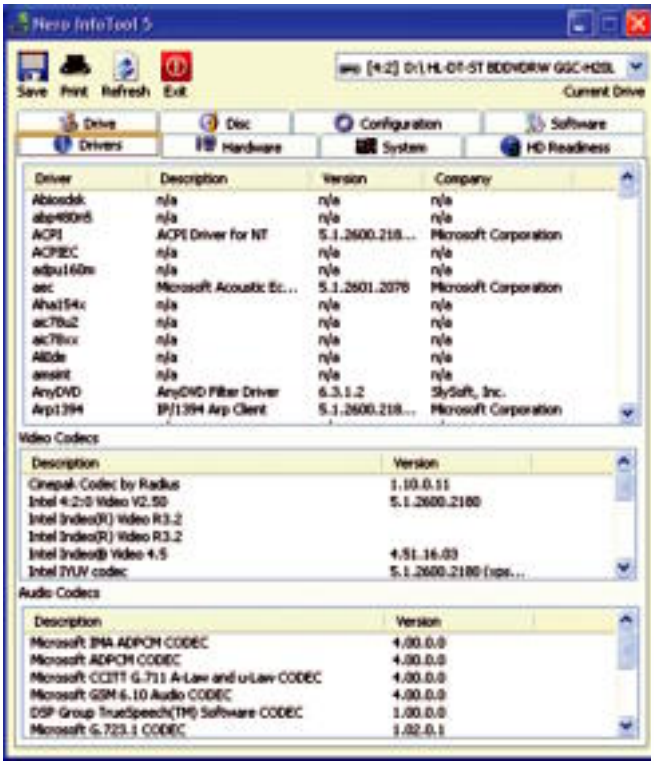
For its part, Nero Vision lets you create, author, and burn video discs. As in Nero 7, this app provides a timeline for editing footage, slots for two audio tracks, a handful of effects and transitions, and a number of menu options (the download of Nero 8 comes with just a couple menu templates, but many more are available for free from the Nero website). These features are available to AVCHD video as well as standard-def formats. And new to Nero 8 is support for Blu-ray authoring (BD-AV), although there are currently no menus, effects, or

audio options when working in this format. A $25 plugin will add HD DVD authoring support to Vision and allow you to play commercial HD DVD and Blu-ray discs in ShowTime, the suite's playback app.

Other suite mainstays include PhotoSnap, which provides a decent array of photo-editing options and effects and a degree of user control that put it slightly ahead of a free editing program such as Picasa; and SoundTrax, which lets you create audio tracks from various source materials, with support for multiple discrete channels.

Nero rounds out these standards (and puffs up its package) with a handful of applications that are clearly geared toward enthusiasts. Examples include the previously mentioned DriveSpeed app; InfoTool, which provides information about your installed hardware, software, drivers, etc.; RescueAgent, for recovering damaged files from an optical disc; and BackItUp3, which lets you perform and schedule full or incremental backups of any drives, folders, files, or connected devices.

Nero 8 has been optimized for Vista, and in our tests it ran stably with the new OS, even in 64-bit mode. Vista users might also appreciate the one-click Copy to Disc sidebar gadget. And folks who like to share audio or video online might benefit from the Export button integrated into Nero's creation apps—if it actually worked. When we selected the Export to Web option, our video was converted to an appropriate format, but then we were left hanging about what to do next. The drop-down menu for selecting a community offered no options, nor was there any place to add a site. The Help button simply took us to the web, where we could have downloaded a PDF of the entire Nero Vision manual. No thanks! We'd just as soon not have the feature than pore over a manual to figure it out.



Apps like InfoTool lend Nero its hardcore character.

While we're fans of Nero's core burning, recoding, and editing apps, and we can even see using some of its other tools on a semi-regular basis, we're just not convinced we need to spring for the inflated package—especially when some of its features feel half-baked.

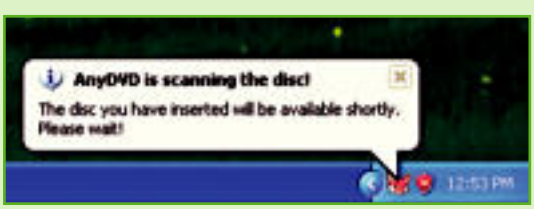
NERO 8 ULTRA — **7**

$80 ($50 upgrade), www.nero.com

THE MISSING LINK

No media suite is complete without AnyDVD

These suites might promise the world, but there's one crucial task that they're plain incapable of: ripping the contents of a commercial DVD. Roxio, Nero, and other software makers must adhere to the Digital Millennium Copyright Act (DMCA), which states that it's illegal to provide technology that circumvents copy protection. But as we all know, there are perfectly legitimate reasons for copying the contents of a disc that has been legally purchased, such as making a backup or converting it for use on a portable player. That's where SlySoft's AnyDVD comes in (49 euros, **www.slysoft.com**). Produced in and sold from Antigua, West Indies, AnyDVD has but one solitary purpose: to free your disc content of copy protection. Once installed, the app hangs out in your task bar; the moment you drop a disc into your optical drive, AnyDVD scans the contents and removes copy protection when necessary from standard-def content, freeing you to proceed with your activities. An HD DVD- and Blu-ray-enabled add-on costs an additional 30 euros. Check out the free 21-day trial. Purchasing the full version makes you eligible for free upgrades for life!



Roxio Easy Media Creator 10

A suite that makes Nero 8 Ultra seem svelte

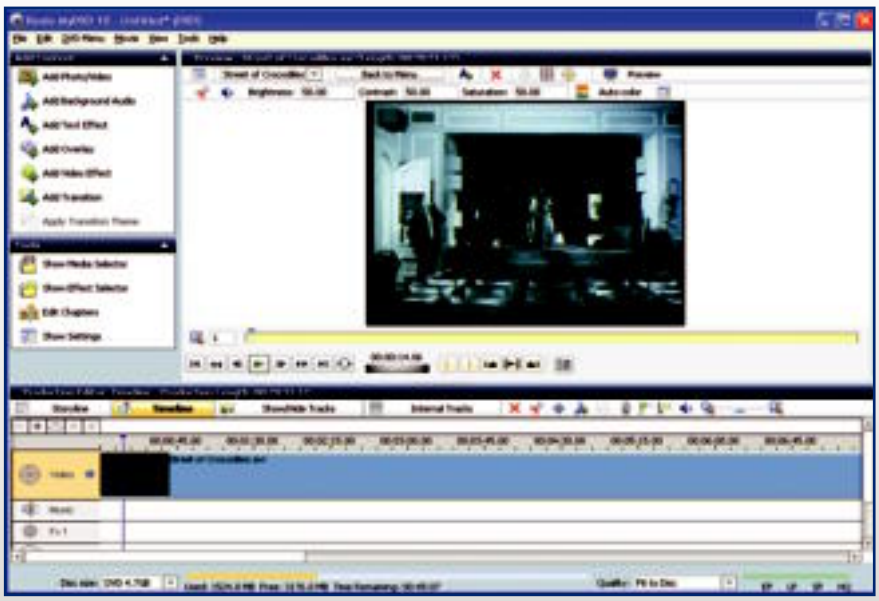
Like Nero, EMC 10 eases you into the app-stravaganza with a categorized front end.

Back when Roxio's product was called Easy CD Creator, it was a favorite among enthusiast disc-makers, but over time it became bloated and buggy, allowing Nero to gain traction. Knowing this, it's hard not to perceive a hint of one-upmanship in Easy Media Creator 10. This suite offers a whopping 29 individual apps to Nero's 22 (whether that's a good thing depends on your uses for such a bounty).

Furthermore, EMC 10 is actually certified for Vista, for whatever that's worth. (As in Nero, the suite's individual apps certainly performed reliably enough, even in Vista's 64-bit mode.) Also, EMC 10 offers *two* sidebar gadgets (versus Nero's one): Audio/Video Converter, which you set up with your preferred profiles, and Audio Capture, for recording Internet radio via your soundcard. Furthermore, metadata such as tags and ratings created in EMC 10 are integrated with Vista's media tools and vice versa.

EMC 10 outdoes Nero in other ways as well. In its PhotoSuite, for example, you'll find an even greater array of editing options and support for layers, as well as templates for a number of photo projects (calendar, collage, card, etc.). EMC's movie-creation app, MyDVD, also packs more effects and transitions than Nero's; its video editor, on the other hand, is equal to Nero's, sporting a timeline for editing video footage and support for two audio tracks.

The area of movie-creation actually serves as a good example of why EMC 10's total app count is so large. Besides MyDVD, the suite also offers MyDVD Express—an unnecessary simplification of an already straightforward program. You also get CineMagic, which lets you drop in video and audio, select a theme (e.g., Memories), and then sit back while a movie is instantly created for you, complete with a cheesy theme-related opening and music that perfectly fits the length of your footage. In other words, there's something for every experience level here. And to this end, Roxio does a decent job of integrating compatible apps for seamless use with one another and providing clear instructions and help files.



MyDVD offers a respectable, easy-to-use tool for creating movies.

Still, we were disappointed with the DivX-to-DVD creation we made in MyDVD. We merely added a static menu to the start of our video, but the resultant disc was unplayable in EMC 10's own playback app, CinePlayer. The menu froze at the title, and we couldn't bypass that screen to access the movie itself. This happened with two different discs. Interestingly, the discs played fine in a set-top DVD player. Their image quality, however, was noticeably inferior to that of the disc we made with Nero (same source material, similar menu, same procedures).

EMC 10 redeemed itself with competitive performance in its Copy & Convert program. To test it, we first shrank the contents of a double-layer commercial DVD containing episodes of a TV show to fit on a single-layer disc. The transcoding/encoding took a little more than 17 minutes (the same as Nero), the video quality was acceptable, and the file contained all the elements of the original—distinct episodes, menus, everything.

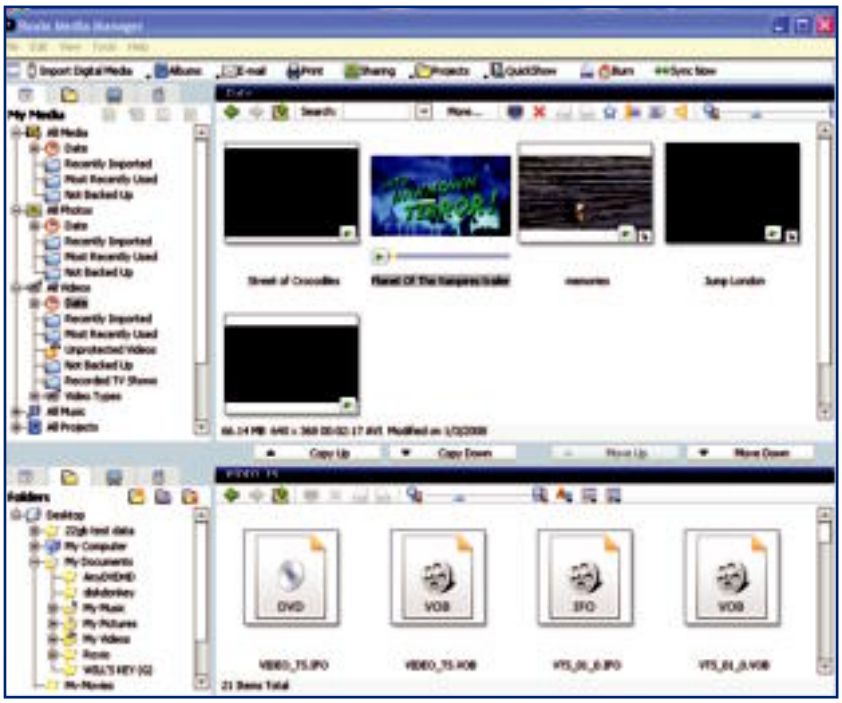
We were also pleased with the app's performance when we converted a single episode using the H.264 codec—again, times were similar to Nero's, and in both apps, the encoder took advantage of all four cores in our test rig. However, EMC 10 bests Nero with support for far more codecs, including DivX and straight H.264.

Something you won't find in EMC 10 is support for Blu-ray, HD DVD, or even AVCHD authoring (or playback, for that matter). You can, however, burn data discs in either the Blu-ray or HD DVD formats, provided you have a capable burner, of course. We tested this functionality by burning 22GB of data to a single-layer Blu-ray disc, which took EMC 10 about 90 minutes, the same as Nero.

Other notable features in EMC 10 include the ability to rip two CDs simultaneously; a backup component that's not quite as robust as Nero's, but does let you schedule and perform unattended full or partial backups; and Media Manager, which gives you views of all the media on your PC and connected devices, lets you create profiles for syncing between the two, and offers a preview function from within the interface. Media Manager also gives you an Upload to YouTube option when you right-click on any media file—and it actually worked.

But we wouldn't say that EMC 10 performed without incident. Besides the CinePlayer glitch we described above, we also experienced occasional lockups in MyDVD and found that we were unable to stop a transcoding job via the Cancel button—rather, we had to resort to Ctrl+Alt+Del. Such are the pitfalls of such mammoth software packages; there are bound to be wrinkles that still need ironing out. We were also peeved to discover that an update of the program requires a user to register and re-enter the friggin' product code. Nero doesn't require either action to update.

If Nero 8 is the media-creation suite for power users, EMC 10 is for everyone else. And we really mean *everyone:* from the grandma who just wants to put together a photo album with minimal fuss to young Billy who can't get enough of ringtones, MySpace, and anything PSP. In that respect, this is probably a good family app—but it's way more than any single, serious computer user is likely to use, so why tolerate the cost, clutter, and inherent compromises?



The green arrows in the corner of your media files let you preview content from with Media Manager.

ROXIO EASY MEDIA CREATOR 10 **7**

$100 ($70 upgrade), www.roxio.com

ARE SUITES FOR SUCKERS?

Testing these two massive apps has us believing that less is more

We hate to give two competing apps the exact same verdict, but Nero 8 Ultra and Easy Media Creator 10 have impressed and appalled us to similar degrees. In the end, we felt they were both merely adequate as complete packages. Yes, it would be nice to have the handful of apps that each package excels at, but all the other add-ons jack up the price and tarnish the shine on the winners. We believe we'd be smarter, savvier, more *Maximum PC,* if you will, by choosing just the media-creation apps that suit our purposes from the various resources at our disposal. After all, iTunes, Windows, DVD Shrink, AutoGK, and the wonderful world of the web all offer serviceable free alternatives that will augment the basic burning software that comes with retail burners. And if you require more advanced features, you're likely better off buying a few single-purpose programs than a do-it-all hodgepodge. That's just our two cents. MPC

Sync Your Online and Offline Calendars

Sometimes you need a calendar you can access from anywhere; sometimes you just need one on your desktop. We'll show you how to make these separate applications play nice.

TIME 00:30 HOURS:MINUTES

For years, we've had the ability to synchronize email across offline and online platforms. That's a no-brainer. But only recently have we stumbled across a rock-solid method for synchronizing that other big part of the typical email program: the calendar.

Yes, we know how easy it is to pull down an iCal or XML feed into a desktop calendar application. That's little more than a copy-and-paste job. We'll still show you how to do it, but we're far more interested in the holy grail: a two-way synchronization between your Outlook or Sunbird client and your Gmail Calendar. Depending on which program you're using, this can be as easy as pie or as fun as a kick to the groin. Our advice? Disentangle yourself from Outlook and move over to Sunbird.

BY DAVID **MURPHY**

WHAT YOU NEED

- **GOOGLE CALENDAR**
  Free, www.google.com/calendar
- **MICROSOFT OUTLOOK 2007**
  $110, www.microsoft.com

  AND
- **SYNCMYCAL PRO**
  $25, www.syncmycal.com

  OR
- **MOZILLA SUNBIRD**
  Free, www.mozilla.com

  AND
- **GCALDAEMON**
  Free, gcaldaemon.sourceforge.net

1 Set up Google Calendar

Before you start your adventures in synchronization town, you need to have all the necessary programs and utilities up and running. If you don't have a Google account, open one now (**www.google.com**). Doing so gains you access to Google's stable of awesome apps—Gmail, Google Docs, Google Talk—but most importantly, it opens the door to Google's mighty online calendar application.

The app itself is pretty straightforward. You'll start off with a primary calendar that you can add all manner of appointments to. If you want to create secondary calendars for alternate purposes (say you want separate calendars for your work life and personal life), just click the Add button on the left of the screen. Select "Create a new calendar" and enter the corresponding information—including whether you want to share the calendar with your friends, the world, or nobody.

Now is the time to separate your calendars by function. Perhaps you want only work-related appointments to appear on your work laptop, whereas you want your soccer schedule and Maximum PC Podcast reminders to appear on your PC at home. We'll show you how to do this with a synchronization program. Trust us, it's a lot harder to divvy up your calendar entries after you've thrown a ton of items into a single container. After you've created your calendars, fire up your calendar application of choice (Outlook or Sunbird).

With Google Calendar, you can import someone else's shared calendar, a public calendar, or a calendar file on your computer itself.

2a The Simple Import: Outlook

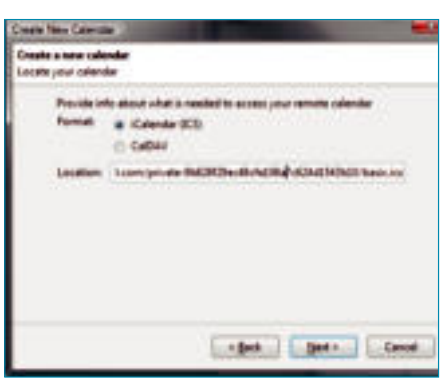
If you have no need to transfer calendar items from Microsoft Outlook to Google Calendar and instead just want to update your home computer with your online centralized list of appointments, then you have no need for synchronization software of any sort. Load Outlook and your Google Calendar page. On the latter, click the downward-pointing arrow to the right of your calendar's name. Select Calendar Settings to bring up a list of options and configurations. Scroll to the very bottom of the page to the section labeled Private Address. Right-click the green iCal button and copy the link to your clipboard.

Switch back to Outlook and click the Tools menu. Select Account Settings and select the Internet Calendars tab. Click the New button—a dialog box will pop up asking for the location of the Internet calendar you plan to add to Outlook. Paste the iCal link into this field and hit Add; don't worry about changing the URL to webcal:// style. Fill in the pertinent details for your calendar on the subsequent screen and press OK. Now when you run any send/receive process in Outlook, the accompanying calendar will update with your current Google Calendar information!

The bottommost green iCal link is the one you care about. The link above it is applicable only if you've opened your online Calendar for everyone to see.

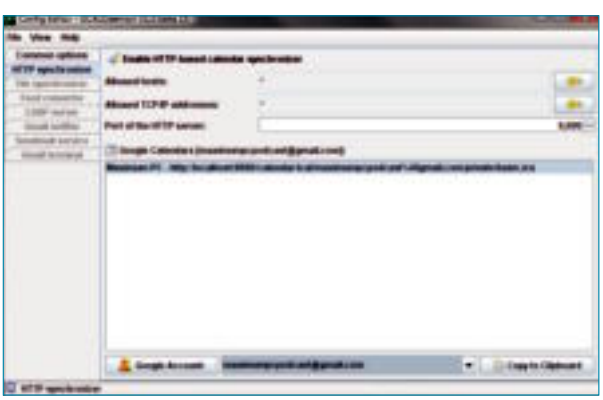
2b The Simple Import: Sunbird

If you thought Outlook's calendar-syncing process was easy, get ready for a treat. Copy the same private iCal link to your clipboard before you fire up Sunbird, Mozilla's open-source calendar-only application. Once the program's running, click the File menu and select New Calendar. You'll be adding a calendar to the network, so select that option and hit Next. Paste your iCal link into the location box on the subsequent screen and press Next again. Name your calendar, assign it a color, and you're done—one-way synchronization accomplished in less time than it takes to drink a can of soda.



Remember how to get this screen: It's the same place you'll go to if you're setting up a two-way synchronization.

3 Set up a Two-Way Sync



To synchronize multiple calendars and Google accounts, just add them into GCALDaemon and use the handy drop-down menu to switch between them.

If you're going the two-way-synchronization route, install the synchronization program GCALDaemon. Next, go to the program folder in your Start menu and click the Install shortcut in GCALDaemon's Services folder. After that, click the Start shortcut in the same folder and then copy this shortcut to your Windows startup folder. Roll your sleeves up to your elbows, head back to the program's folder in the Start menu, and click the Config Editor.

The subsequent screen of options can be a little confusing—not helped by GCALDaemon's lack of an instruction manual. It's an awesome program nevertheless. We'll show you the basics of getting two-way synchronization up and running, but know that the program has many more interesting features buried beneath its complex shell, e.g., one-way syncing of Gmail contacts, file-based calendar synchronization, and the ability to run programs using e-mailed commands.

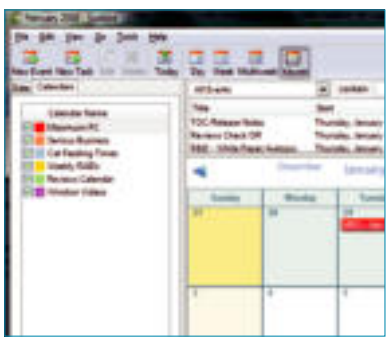
Click the HTTP Synchronizer tab on the main page of GCALDaemon's Config Editor. Make sure there's a green check mark instead of a red "X" next to "Enable HTTP-based calendar synchronizer." Click the Google Account button at the bottom of the screen, click New Account, and add your details. Make sure you include your full email address, such as maximumpcpodcast@gmail.com. Type in your password twice, hit Verify for good measure, then click OK.

Now, select your Google Account from the drop-down menu at the bottom of the screen. A list of your calendars will pop up; select the calendar you want to import and press the Copy to Clipboard button.

4a Two-Way Sync: Sunbird

Synchronizing a calendar between Sunbird and Google Calendar is a less painful process than what Outlook users experience (as you'll learn below). Fire up Sunbird and create a new calendar by right-clicking the Calendar Name box and selecting New Calendar. You'll choose a calendar that's "On the Network," as you'll be pulling the information that's being relayed to your computer via GCALDaemon's synchronizer.

Click Next, then copy and paste the .ics calendar link from GCALDaemon's HTTP Synchronizer screen—the one you just navigated to in the previous step—into the Location field. Press Next again, assign a name and color to your calendar, and you're done. Your calendar should now auto-populate with all of the entries from your Google Calendar. Add, edit, or delete an entry from Sunbird and it'll be immediately reflected in your online calendar. The same is true in the opposite direction, although we've found that there's often a slight delay when synchronizing from Google Calendar to Sunbird. If you're impatient, you can jam Control+R in Sunbird, which automatically refreshes your calendar with the latest information it can find.

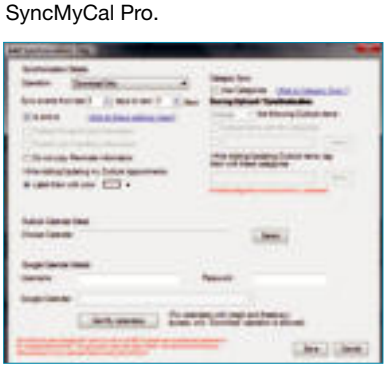


You can synchronize multiple calendars in Mozilla Sunbird. They'll all appear in the left-hand menu, nicely color-coded.

4b Two-Way Sync: Outlook

In a perfect world, you'd use the steps listed above to synchronize a calendar with Outlook. But Microsoft's software doesn't like the fact that you're pointing to a local calendar link, so you'll have to get a little creative. And by that we mean you're going to have to dabble with a program you'll have to pay for.

SyncMyCal Lite allows you to synchronize up to seven days' worth of events: from three prior to the current day to three days after. But we think it's worth spending $25 for the unlimited synchronization that comes with SyncMyCal Pro.



Fiddle around with SyncMyCal's category synchronization options if you want to link specific events with your online calendar.

Installing the program adds a toolbar to your Outlook application. Click the Settings button and select Sync Operations. Click the Add button and SyncMyCal's configuration options will pop up. Next, select one of the synchronization options in the Operation menu. Choosing the Outlook preference will overwrite existing events on the Google Calendar with any Outlook-based updates, and new Google events will transfer down to your Outlook calendar. The Google preference overwrites existing Outlook events with Google-updated information and picks up any new events created on the Outlook side.

Make your choice and select the Outlook calendar you want to synchronize. Enter your Google Calendar details in the provided fields and press the Get My Calendars button below that. Select the Google Calendar you want to synchronize from and/or to and hit Save.

If you use the free version of the app, you'll have to press the Synchronize button on the toolbar every time you want to update your calendars—the auto-sync option only comes with SyncMyCal Pro. MPC

Ask the Doctor

Diagnosing and curing your PC problems

IT ALL WENT BLANK

I recently purchased an LCD monitor, but when I installed it, no picture appeared. When I replaced the new monitor with the old monitor, I again got just a black screen. The computer is running and the connections are correct. I'm deciding between building a new computer or just buying a graphics card and hoping the picture returns. Is there a better solution or has the motherboard been fried?

—Stephen Janes

The Doctor is willing to venture that you haven't toasted your motherboard merely by plugging in a new monitor, though it is curious that your older monitor no longer works. Odds are good you've jiggled something out of place. Unplug your monitor, unplug your computer, open up your computer, and reseat your videocard—detach it from the side of your case and remove it from the connector on the motherboard. Dangle the card in the air for a few seconds and then reattach it. Make sure the card is firmly and properly placed, you'll usually hear a clicking noise if you've done this correctly. Screw the card into place, plug your computer and monitor back in, flip the power switch, and see if that doesn't fix your problem.

OEM VISTA REPAIR

I have Vista Home Premium. After doing a Windows update, my computer would not boot. The OS reported that the registry was corrupted. I tried to boot off my Vista DVD to start a System Restore from outside of Windows, but to my surprise, Windows Vista Home Premium doesn't offer a repair utility option when booting from the DVD. I have a Lenovo Laptop 7757.

What options do I have? How does one perform a manual restore of the registry files if Microsoft doesn't offer System Restore from outside of Windows?

—Leon Garfield

It sounds as though you have an OEM version of Vista, which lacks options for repairing Vista installations when you boot from the DVD. First, try to boot into Safe mode. Jam on the F8 key while your computer starts to pull up Vista's Boot menu. Boot the computer into "last known good configuration" first—ideally, that should fix the problem. If it doesn't, head back to the Boot menu and select Safe mode. Once there, select Vista's System Restore feature and roll back to an earlier restore point.

If you can't boot into Vista, try to borrow a non-OEM Vista disc from a friend and boot off of it into Repair mode. From there, you can run a chkdsk or let Vista automatically repair the operating system. But you'll never get to that option from an OEM disc.

SPEED ME UP, SCOTTY

I am paying for a 5Mb/s cable download speed. I have a router that has both wireless and wired connectors on it. I have two stand-alone full-size tower PCs connected to the router by wired connectors. When downloading very large files, I noticed that my top download speed is 660Mb/s.

I believe that the bottleneck is my 1Gb/s NIC card, so I would like to use two ports on my router and use two NIC cards in my computer to increase my bandwidth. In my opinion, it does not make any sense to pay for a truly high-speed cable connection if you have a severe bottleneck with the network interface card. Right?

—Walter

Speed Test is a great online application that lets you keep a history of download and upload speed measurements.

The Doc is scratching his head over this one, but since you say your broadband connection is 5Mb/s, he's going to assume that the top download speed you're seeing is 660 *kilobytes* per second, which is about what you're paying for. Even so, it's difficult to formulate an answer without more information, such as how you're measuring your download speed and where you're downloading from.

For starters, there's a massive speed difference between the connections (be they wired or wireless) on your local network and your connection to the Internet. Even an awesome net connection will be an order of magnitude slower than Gigabit Ethernet. Even if your network interface card and the wired portion of your router are both of the Gigabit variety and you're using Cat5e or Cat6 Ethernet cable, you won't get a full gigabit per second of throughput due to protocol overhead.

But it's also important to note the distinction between your connection speed and the speed at which you can download files from a given website. Bandwidth can be costly, so most sites put limits on the speed at which a remote client can download files. Just because you have a 5Mb/s broadband connection doesn't mean every website will allow you to suck down files at that pace because they have to pay for the bandwidth consumed at their end of the pipe.

If you want to measure your Internet connection speed, point your web browser to a site equipped with a tool designed for that purpose, such as Speed Test, (www.speedtest.net). If this tool indicates that your connection speed really is 660Kb/s, then you should ask your service provider to explain why you're not getting what you're paying for.

As for your idea of combining two router ports and two NICs to double the bandwidth of a single PC, it just won't work with typical consumer hardware. You'd need to buy spendy enterprise hardware to do that.

NO LOGIN SCREEN

My old computer's login screen won't display. When I boot the rig, I get past the XP loader only to get a black screen, where the user accounts should be. I'm currently dual-booting XP and Vista on one hard drive. The computer has an Intel chipset with a Pentium 4.3GHz CPU and a 400-watt PSU. Is there any way to load XP without wiping my hard drive?

—Kyle Windsor

The Doctor is willing to venture that you're having an issue with something display related, be it your monitor, videocard, or drivers. Enter Safe

Ask the Doctor

Diagnosing and curing your PC problems

mode by repeatedly pressing the F8 key while your computer is booting. Safe mode should resort to a bare VGA display, which will allow you to perform a number of troubleshooting options on your PC.

From the Control Panel, go to System Properties. Go to the Device Manager and uninstall your videocard's display drivers. Restart your computer; you should be able to enter your normal Windows XP operating system. Then hop online, grab the latest drivers for your card, and install them.

If you're still finding no success, you probably have a critical Windows issue. To test this theory, fire up Vista and back up all your critical XP files. Then wipe your XP partition and reinstall the OS—this will give you some funky boot-loader issues since you'll be installing an older OS after Vista, but you should be able to pull up both OSes after running Vista's boot repair wizard.

VISTA KILLS NETWORK TRANSFERS

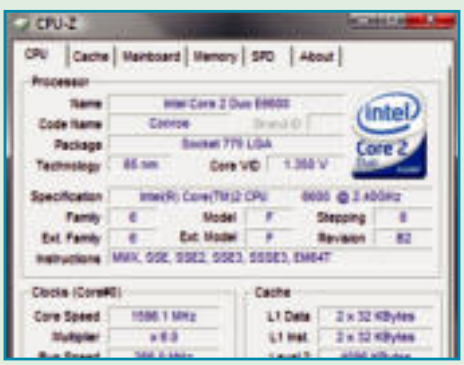
I just built a new PC, and I'm dual-booting Vista and XP. When in Vista, I cannot seem to transfer files to my file server. In XP, on the same machine, it works great. When I transferred a 72MB folder across the wired network using Vista, it took over two hours. The same files in XP took less than two minutes. Oftentimes, Vista times out with a "program not responding" error. Any suggestions before I totally banish Vista?

—Shannon B. Tatu

Quite the brouhaha is raging on the Internet right now regarding Vista's slow transfer speeds—the operating system seems to keel over and die when it tries to copy files on a single drive, across drives, or especially across a network.

Microsoft has yet to come up with a solution for your woes, though it has managed to find a potential reason for the problem. Network transfer speeds will be drastically diminished if you're running an application that uses Vista's Multimedia Class Scheduler while transferring files. For example, Windows Media Player will kill network-transfer speeds.

Aside from that, your best bet is to install the most recent Vista SP1 release candidate. It isn't the final SP1 release, so caveat emptor, but this update dramatically improves network-transfer performance. Updated Vista rigs are capable of transfer speeds that are three times faster than those of non-updated Vista machines. While the Doctor hasn't experienced the extreme slowness you've described, the numerous tweaks and fixes in SP1 might very well set your transfers right. Give it a shot, as really, it's your only option right now.



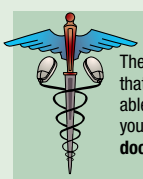
CPU-Z gives you oodles of information about your rig, although you should be able to figure out most upgrading issues by simply looking at your motherboard's specs.

WHATCHA GOT, MOM?

I want to upgrade a few things in my mom's PC—namely, the RAM. We live on opposite sides of the country. Is there a way she can find out for me what kind of RAM is in her computer?

—Craig

Have your mom grab CPU-Z (www.cpuid.com). When she runs the app—a single no-installation-needed executable—a ton of information about her computer will pop up. She'll be able to tell you about her processor, socket type, and motherboard, as well as the kind of RAM currently installed in her machine. MPC



The Doctor plans to release a version of himself that's entirely wireless. With the Doctor Air, you'll be able to clone his mass of knowledge and carry it with you. Unless, of course, you just feel like emailing **doctor@maximumpc.com** for old time's sake....

White Paper: HD Video Encryption

Hollywood math: HDCP + AACS = PITA²

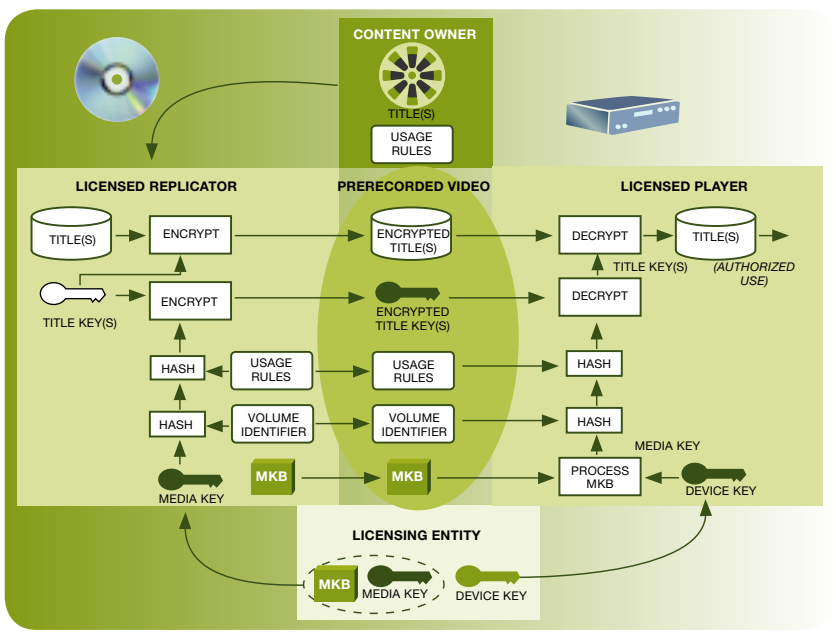
BY ZACK **STERN**

We're philosophically opposed to any technology that impairs our fair-use rights, but the Hollywood studios insist on infesting their products with annoyances such as HDCP (High-bandwidth Digital Content Protection) and AACS (Advanced Access Content System) which do just that. Since we also believe knowledge is power, here's a primer on how those systems work.

But before we dive into the details, allow us to point out the absurdity of digital rights management—in all its many forms. DRM treats those of us who purchase movies and music, and then make backup copies or transfer that content to our PCs and digital media players, as criminals. We are not pirates; we are Hollywood's best customers. And we understand that purchasing content is a prerequisite to claiming fair-use rights.

HDCP and AACS add to the complexity and the cost of every PC, every HD DVD and Blu-ray drive and disc, every monitor, every commercial operating system, most every A/V receiver, and every HD television on the market—and all it takes to defeat this supposedly invincible technology is an easily obtained program: SlySoft's AnyDVD HD (**www.slysoft.com**).

HOW IT WORKS **Copy protecting a Blu-ray or HD DVD movie**



A replicator encrypts content on a Blu-ray or HD DVD disc using a Media Key and Media Key Block provided by the AACS Licensing Authority (AACS LA). The AACS LA provides the media player (either a stand-alone device or a PC application) with a corresponding Device Key. The media player combines its Device Key with the Media Key Block to calculate the Media Key. If the calculated Media Key matches the Media Key on the disc, the content can be decrypted.

THE CRYPTONOMICON

AACS is a cryptographic system designed to limit the output and recording of protected content to methods the content owner approves of. Unlike the simpler CCS (Content Scramble System) used to encrypt commercial DVDs, AACS uses a set of keys that can be tied to a specific player—much like a serial number.

The AACS process results in a "play" or "don't play" validation. A Blu-ray or HD DVD disc includes a Media Key Block that is combined with a playback device's unique set of keys to generate a Media Key, which is then combined with another piece from the disc—the Volume ID key. (Only a commercial burner can reach the hidden section of that disc to write the Volume ID key, a technique designed to thwart disc-to-disc copies on consumer-grade equipment.) The combination of aforementioned keys culminates in the Volume Unique Key. This key is used to decrypt the disc's title keys and then—finally—the movie itself. At this point, the content moves into the HDCP chain, where it is re-encrypted until it reaches the display (we'll explain HDCP in more detail shortly).

If an AACS device is compromised, newly pressed content can be published with an updated Media Key Block that is incompatible with the compromised device's keys. This, in essence, revokes the known cracked keys and disables the associated players. The new Media Key Block, however, will continue to function with any older keys that remain secure.

SECRET HANDSHAKES

HDCP is an interconnect system that works hand-in-glove with AACS. Designed to protect the transmission of high-bandwidth audiovisual streams—at rates up to 5GB/s—HDCP has been deployed in all three of the major digital display interfaces: DVI, HDMI, and DisplayPort. It is also supported in the less-common UDI (Unified Display Interface) and GVIF (Gigabit Video Interface). Since it must be everywhere in the display chain, you'll also find HDCP in videocards, Blu-ray and HDVD DVD drives, HDTVs, A/V receivers, and CableCARD digital CATV tuners. The technology can also be incorporated into repeaters (which can be essential for long cable runs) and switches (crucial for connecting more than one player to a display with a single digital-video input).

The HDCP authentication process is the same for every content player: Software on the PC or set-top box generates a playback signal, which initiates a handshake process. Using a temporary random number, unique keys built into each HDCP transmit device (e.g., a videocard) and receive device (e.g., an HDTV) are used to generate a checksum. If the checksums are identical at each stage, the content is green-lit for playback.

This process is repeated every few seconds, and the signal is reauthenticated

at each node in order to prevent the signal from being intercepted midstream (to prevent anyone from tapping into and recording the digital bit stream). If the handshake fails at any point along the way, that authentication failure is reported to the playback software.

Furthermore, the audio-video stream is re-encrypted before it enters the HDCP pipeline, and it's decrypted when it arrives at the final playback device.

DON'T HATE THE PLAYER

Representatives from the companies responsible for creating these technologies are quick to point out that they've developed "content protection," not "copy protection," systems. The technologies are inert, they say; it's up to the movie studios to deploy them as copy-protection schemes. HDCP, for instance, simply notifies the player if there's a non-HDCP device in the playback chain. Software in the player then executes the rules, (established by the media owner) that are encoded within the content.

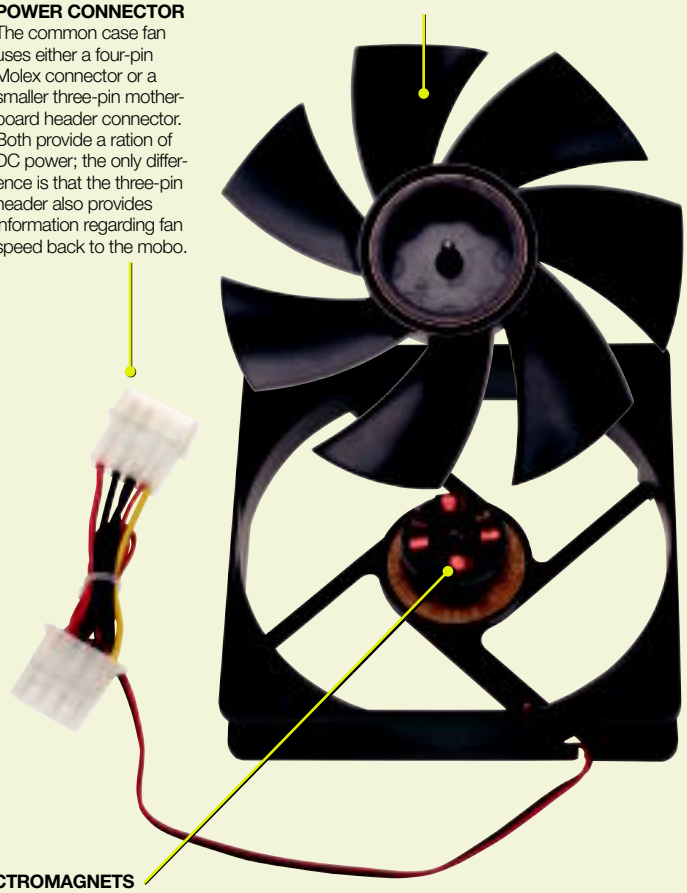
One of those rules is known as managed copy, which allows the consumer to make a limited number of legal backup copies of an HD DVD or Blu-ray disc or transfer the copy-protected content to another device, such as a media server. Theoretically, this backup copy would be subject to verification through an online verification system, which would require the playback device to be connected to the Internet. Unfortunately, managed copy still hasn't been implemented in the real world.

The Image Constraint Token is a more onerous rule that gives content owners the power to make the software stop playing content or downsample video to 960x540 resolution—a fraction of the image quality you thought you were buying—if HDCP is missing at any stage in the playback chain. This can occur when the video is played through an analog component connection, but there are also many early HDTVs, videocards, and computer monitors in people's homes that were manufactured prior to the development of AACS and HDCP. Owners of Microsoft's Xbox 360 HD DVD drive should be aware that since that device uses a USB connection—considered to be an unsecure display path—it is also susceptible to the Image Constraint Token. Sony's PlayStation 3, on the other hand, is fully HDCP and AACS compliant (unless you're using one of its analog display connections).

The Image Constraint Token is invoked on a per-disc basis, and as far as we know, no studio has activated the technology in their current releases. In fact, rumor has it that they've informally agreed not to implement it until at least 2012; but that is of little consolation to anyone who's still using non-HDCP gear. MPC

A PC Fan

Without fans, our computers would be toasty inside. But how does this simplest of cooling devices actually work, and what's the difference between a noisy fan and a quiet one? We delve into the inner workings of this miraculous device to unravel these mysteries.



FAN BLADES When fan blades spin, they move air. However, everything from the number and size of blades on the fan to their pitch to the shape of the fins impacts both the fan's airflow and its noise profile.

POWER CONNECTOR The common case fan uses either a four-pin Molex connector or a smaller three-pin motherboard header connector. Both provide a ration of DC power; the only difference is that the three-pin header also provides information regarding fan speed back to the mobo.

ELECTROMAGNETS Most computer fans include a brushless DC motor that uses four electromagnets to push and pull magnets attached to the hub of the spinning portion of the fan. Alternating the polarity on the electromagnets causes the fan to spin at different speeds. By winding the motors differently—connecting the wires on the electromagnets in a different order—you can adjust the torque and maximum speed of the motor.

Any requests? What hardware—new or old—would you like to see go under *Maximum PC's* autopsy knife? Email your suggestions to **input@maximumpc.com.**

GORDON **MAH UNG**

Re-Examines RealTek Audio

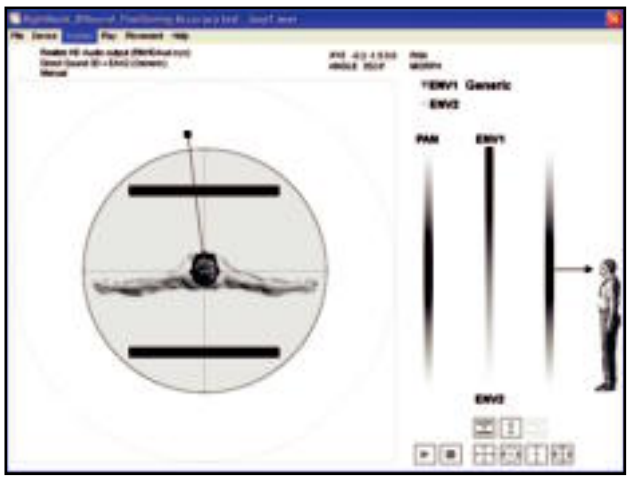
And thinks the company's cheating drivers might finally be fixed, maybe

In December 2006, I took RealTek to the woodshed for its cheating drivers, which made many EAX-enabled games sound simply awful.

For months, we've been rattling motherboard makers, including Nvidia (which uses RealTek parts on many of its reference motherboards), about the issue, but RealTek seemed not to get the message, as nothing changed—until recently, that is. Indeed, I was pretty surprised when testing XFX's nForce 780i-based motherboard to find that RealTek had finally fixed the problem with EAX support.

The problem was that RealTek HD Audio drivers would tell games that EAX support was enabled, which would cause games to pass off the audio mixing to the soundcard drivers. In RealTek's case, that often (though not always) produced terrible sound. A tank that was supposed to sound as though it was 200 meters away sounded like it was 10 meters away. And instead of a grenade sounding muffled by the presence of a wall, it sounded like it was next to you.

Why would RealTek do this? Falsely claiming to have EAX support is akin to a videocard driver claiming to run16x AA filtering when, in reality, no filtering is occurring.



With older RealTek drivers, a simple position test would show that EAX filtering wasn't working correctly.

But RealTek's R 1.86 drivers dated February 1, 2008 seem to finally enable EAX. Using RightMark's 3D Sound positioning utility, I found that the occlusion effect finally worked as it does on all other EAX-enabled cards. The obstruction effect almost works but is a bit heavy-handed, blocking all sound when you should still hear some audio.

In real-world gaming tests, however, EAX support seemed sporadic. Battlefield 2 audio was as poor as it was previously when EAX was enabled and the game let the RealTek part do the mixing. But when we fired up the EAX-enabled BioShock and ran the new drivers through their paces, with EAX and reverb enabled, the experience wasn't bad. Compared to an X-Fi XtremeGamer soundcard, the onboard RealTek component's audio was still clearly inferior but at least not intolerable, as it was with Battlefield 2.

I'll continue to follow this issue, but at least it appears that RealTek is finally addressing the problem.

David Murphy

Doesn't Like Microsoft Mucking with Standards

Guess who's to blame for your media-streaming woes

What do you do with a media-streaming device that doesn't connect to anything? That's the question posed by the HP Media Vault NAS, which I reviewed this month (page 79). I found that I was unable to stream a movie on the device's hard drive to any connected platform in my house, including Windows Media Player 11 and the Xbox 360.

But determining the culprit in this media mess wasn't as cut-and-dried as I expected. I was ready to hoist the sails and speed away from the sinking HP device, but a little bit of research brought a new target to bear: Microsoft. The company has allegedly modified the open UPnP protocol the Xbox uses to connect to devices. Company reps won't admit to any outright fudging, but something seems suspicious in their response: "The Xbox 360 console is optimized to communicate with Microsoft UPnP streaming devices… to provide the best possible consumer experience with the Xbox 360 dashboard."

The blog Mediaholic interviewed the CTO of TwonkyVision at the 2006 Consumer Electronics Show—TwonkyVision being the creator of TwonkyMedia, the streaming service the QNAP TS-109 Pro NAS box uses to connect to the Xbox. This works, according to the CTO, because Twonky reverse engineered the protocol to end-run Microsoft's Windows Media Connect-only restriction.

If that's correct—and I suspect it is—that's why I'm hacked off. An open standard is dubbed "open" for an explicit reason: A product that follows the standard should be able to interoperate with other standard-friendly devices. You're not following the standard if you're tweaking it to work with only your branded platforms.

HP might share some blame for not figuring out a way to make streaming work, but why should a company have to reinvent a wheel that Microsoft's broken?

How We Test

Real-world benchmarks. Real-world results

We use the following multithreaded apps to test a PC's performance relative to our zero-point test bed:

Adobe Premiere Pro CS3: We take HD video shot on a pro Sony camera and output the edited results to a Blu-ray-friendly MPEG-2 file format. This test favors clock speed and likes quad-core CPUs.
Adobe Photoshop CS3: A gazillion Photoshop filters are applied to a RAW digital-image format.
Photodex ProShow Producer: This pro-level photo slide-show application spits out a hi-def MPEG-2 file format and favors multicore CPUs.
Mainconcept Reference: We take an HD-resolution MPEG-2 file and convert it to H.264/AVC with this multithreaded encoder. Used by advanced amateurs and professionals, this encoder likes fast, efficient multicore procs.
FEAR: Our DX9 gaming test runs at 1600x1200 with soft shadows and is a good approximation of gaming performance for slightly older titles.
Quake 4: Based on the Doom 3 engine, this OpenGL shooter is optimized for dual-core CPUs, and although older, it still reveals weaknesses in OpenGL drivers.

There's More Maximum PC Online!

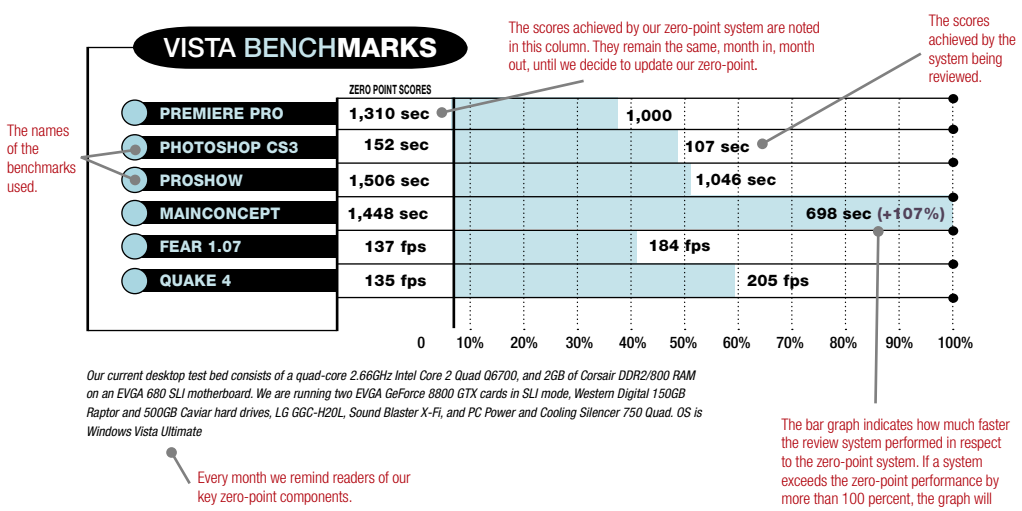
For web-exclusive hardware, software, and game reviews, head to **www.maximumpc.com/exclusive** today. Here are just a few of the many reviews you'll find online at MaximumPC.com.

- Wolfking Warrior XXtreme gaming keyboard
- NEC Multisync LCD195NXM monitor
- Antec Veris MX-1 drive enclosure
- Thermaltake BlacX drive enclosure
- CablesToGo RapidRun System
- Soundcast Speakercast
- Cambridge SoundWorks iPod Doc i765
- MemoRight 32GB SSD
- Nikon D300 digital SLR

PLUS the awesome No BS Podcasts!

How to Read Our Benchmark Chart

Maximum PC's test beds double as zero-point systems, against which all review systems are compared. Here's how to read our benchmark chart.


VISTA BENCHMARKS
ZERO POINT SCORES
PREMIERE PRO
1,310 sec
1,000
PHOTOSHOP CS3
152 sec
107 sec
PROSHOW
1,506 sec
1,046 sec
MAINCONCEPT
1,448 sec
698 sec (+107%)
FEAR 1.07
137 fps
184 fps
QUAKE 4
135 fps
205 fps
0
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
The names of the benchmarks used.
The scores achieved by our zero-point system are noted in this column. They remain the same, month in, month out, until we decide to update our zero-point.
The scores achieved by the system being reviewed.
Our current desktop test bed consists of a quad-core 2.66GHz Intel Core 2 Quad Q6700, and 2GB of Corsair DDR2/800 RAM on an EVGA 680 SLI motherboard. We are running two EVGA GeForce 8800 GTX cards in SLI mode, Western Digital 150GB Raptor and 500GB Caviar hard drives, LG GGC-H20L, Sound Blaster X-Fi, and PC Power and Cooling Silencer 750 Quad. OS is Windows Vista Ultimate
Every month we remind readers of our key zero-point components.
The bar graph indicates how much faster the review system performed in respect to the zero-point system. If a system exceeds the zero-point performance by more than 100 percent, the graph will show a full-width bar and a plus sign.

BEST OF THE BEST

Our monthly category-by-category list of our favorite products. New products are in red.

High-end videocard
XFX GeForce 8800 Ultra

Midrange videocard
EVGA e-GeForce 8800GT SSC 512MB

Soundcard
Creative Labs X-Fi XtremeGamer Fatal1ty Pro Series

Hard drive
Seagate 1TB Barracuda 7200.11

External backup drive
Seagate FreeAgent Pro 750GB

High-def burner
LG GGW-H20L

DVD burner
Samsung SH-203

High-end LCD monitor
Gateway XHD3000

Budget LCD monitor
Samsung SyncMaster 206BW

Socket AM2 Athlon 64 mobo
Gigabyte GA-M59SLI-S5

Socket 775 Core 2 Duo mobo
Asus P5E3 Deluxe WiFi-AP@n

HD-based MP3 player
Apple iPod

Flash-based MP3 player
Toshiba Gigabeat MET-400

5.1 speakers
Logitech Z5500

2.0 speakers
Audioengine 5

Midtower case
Antec Nine Hundred

Full-tower case
Gigabyte 3D Mercury

Games we are playing: Lord of the Rings Online: Shadows of Angmar, Sins of a Solar Empire, Mythos, Call of Duty 4: Modern Warfare, Team Fortress 2, Portal, BioShock.

MSI R3870 X2 T2DIG

Can a double shot of Radeon outdo a single dose of Ultra?

The dual Radeon 3870 GPUs require a lot of board real estate, which means the Radeon 3870 X2 won't fit in every case (although it's no longer than Nvidia's GeForce 8800 Ultra).

AMD's Radeon HD 3870 is a fine GPU for the money. It doesn't outperform Nvidia's GeForce 8800 GTX, and it lags far behind the extravagant 8800 Ultra, but it does deliver a phenom— er, make that a tremendous price/performance ratio.

So what happens when you put two of these parts—each with its own 512MB frame buffer—on a single board? You get a Radeon R3870 X2. The result isn't as spectacular as you'd expect, but MSI's implementation delivers plenty of bang for the buck. This card isn't an Ultra killer by any means, but with a price tag of just $450, it doesn't need to be.

There's nothing mysterious about the R3870 X2—the two GPUs are exactly the same as those on a single-GPU card. Each one has 320 stream processors, a 256-bit memory interface, support for AMD's Unified Video Decoder (for offloading HD and Blu-ray video-decoding from the host CPU), and dual-link DVI with HDCP on both links (to support the native resolution of 30-inch LCD panels).

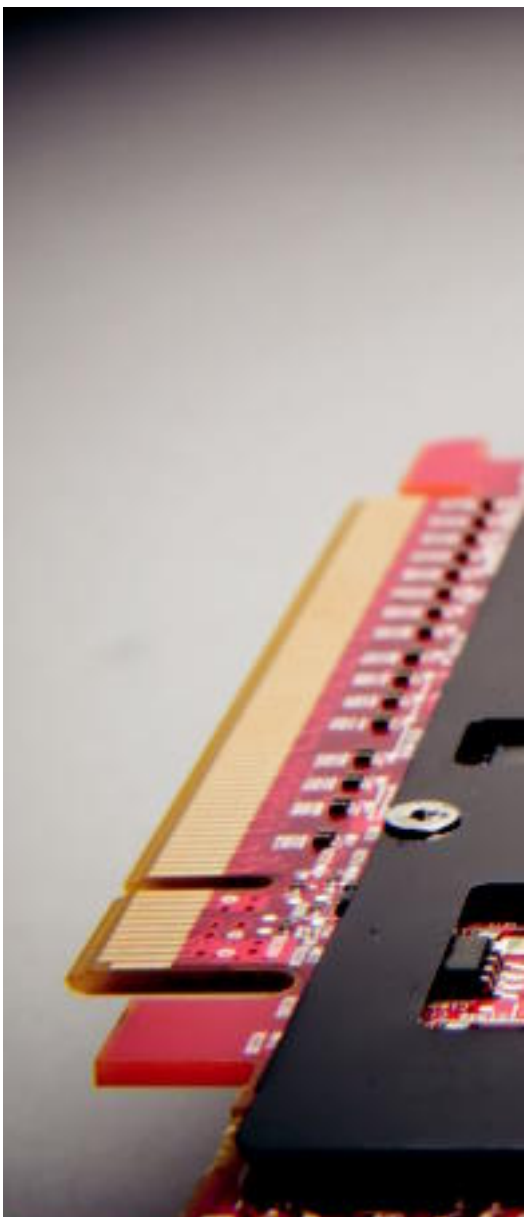
If you care as much about high-definition video decoding as you care about gaming, you probably know that neither Nvidia's 8800 GTX nor its 8800 Ultra supports those last two features. And unlike Nvidia's new GPUs that *do* fully offload HD video decoding, the R3870 X2 supports the incremental updates to DirectX: Direct3D 10.1 and Shader Model 4.1 (although we believe this support to be unimportant right now).

MSI set the GPUs' cores to run at 828MHz and the memory at 955MHz, a fraction faster than AMD's reference-design specs of 825MHz and 900MHz, respectively. As with AMD's 3870 X2 reference design, MSI's board has two 512MB frame buffers, one for each GPU. AMD's reference design and MSI's implementation both use GDDR3 memory, compared to the GDDR4 memory found on single-GPU 3870 cards. AMD tells us there's nothing about the design that would prevent its board partners from using GDDR4 memory or from increasing the size of the frame buffers (although we suspect there wouldn't be a tremendous difference in performance from either design change).

A PCI Express 1.1 bridge chip sitting between the two processors effectively creates CrossFire on the card (with 16 bi-directional lanes for each GPU) without the need for a CrossFire chipset on the motherboard. There is, however, a single interconnect that will allow you to build a CrossFireX rig with four 3870 GPUs onboard, but that *does* require a CrossFire chipset. The board itself supports PCI Express 2.0, but AMD tells us that putting a PCI Express 2.0 bridge chip between the two GPUs would have delayed the product and wouldn't have yielded much of a performance boost anyway.

Having all the components on a single board strikes us as a much more elegant solution than sandwiching boards together, which Nvidia did with its since-discontinued 7950 GX2. It also allows AMD to use a single cooler, which is located at the very end of the board and exhausts outside the case, for both GPUs and both frame buffers.

Having a single fan not only renders the card nearly as quiet as a single-GPU configuration but also avoids the need for twice the electrical power. The R3870 has two auxiliary power sockets



BENCHMARKS

	MSI RADEON 3870 X2	XFX GEFORCE 8800 ULTRA
WINDOWS XP		
3DMARK06 GAME 1 (FPS)	**47.6**	35.2
3DMARK06 GAME 2 (FPS)	**42.1**	31.7
CRYSIS (DX9) (FPS)	23.1	**38.6**
UNREAL TOURNAMENT 3 (FPS)	86.5	**97.6**
WINDOWS VISTA		
3DMARK06 GAME 1 (FPS)	**46.4**	34.3
3DMARK06 GAME 2 (FPS)	**41.9**	30.9
CRYSIS (DX9) (FPS)	26.7	**30.1**
UNREAL TOURNAMENT 3 (FPS)	68.4	**75.4**

Best scores are bolded. AMD-based cards tested with an Intel D975BX2 motherboard; Nvidia-based cards tested with an EVGA 680i SLI motherboard. Intel 2.93Ghz Core 2 Extreme X6800 CPUs and 2GB of Corsair DDR RAM used in both scenarios. Benchmarks performed on ViewSonic VP2330wb monitors.

SPECS

GPU	Radeon HD 3870 (x2)
GPU MANUFACTURING PROCESS	55nm
MEMORY	512 MB GDDR3 (X2)
FORM FACTOR	Dual Slot
DISPLAY INTERFACE	Dual-Link DVI with HDCP on both links
PCI EXPRESS SUPPORT	2.0 on the motherboard; 1.1 on the card
DIRECTX SUPPORT	DIRECT3D 10.1; Shader model 4.1
POWER SOCKETS	One six-pin, one eight-pin

You'll need both the six-pin and eight-pin power connectors if you intend to overclock a 3870 X2 board.

onboard, one six-pin and one eight-pin, but only the six-pin socket is needed for normal operation. If you intend to overclock the board, you will need to send power to both of them. In our tests, our 3870 X2 test system consumed about 170 watts at idle and around 275 watts under load, compared to the 3870's 117 watts at idle and 208 watts under load.

We periodically update the games we use for videocard benchmarking, but we've stuck with the Shader Model 3.0 tests in the artificial benchmark 3DMark06 as a means of providing continuity. The results we've seen with the 3870 X2, however, indicate that the benchmark has finally outlived its usefulness: The 2x performance boost it delivers there doesn't jibe with the frame rates we saw in actual games. In fact, there was virtually no performance scaling in Crysis *at all* with the 3870 X2 when compared to a single Radeon 3870.

The 3870 X2 is a good solution, but it doesn't solve the fundamental problem with dual-, tri-, and quad-GPU systems: Their performance doesn't scale with every game—including high-profile titles like Crysis that you'd buy these cards for in the first place.

—MICHAEL BROWN

MSI R3870 X2 T2DIG

8

TRUTH

Relatively quiet and power efficient; offloads video-decoding chores from the host CPU.

CONSEQUENCES

Currently delivers no performance scaling with the most demanding game on the market today.

$450, www.msicomputer.com

Soundcards Are Back!

Your ears deserve better than onboard audio

A sleek shield covers the electronics in Asus's new Xonar D2.

Who'd have thunk it? Long considered a dead zone, soundcards are making a resurgence. Driven by an outcry for audio that doesn't sound like a box of snap, crackle, pop every time you access your USB ports, manufacturers are releasing new soundcards that surpass the free audio that comes with your motherboard. This month, we test an Auzentech card that uses a Creative Labs chip and Asus's new entry into PC audio.

—GORDON MAH UNG

AUZENTECH X-FI PRELUDE 7.1

It used to be that if you wanted the latest Creative audio chip in your PC, there was only one way to get it: buy a Sound Blaster soundcard. That changes with Auzentech's X-Fi Prelude 7.1 card.

The Prelude packs Creative's top-end X-Fi DSP along with 64MB of XRAM. Auzentech doesn't stop with the vaunted X-Fi; the card also sports higher-spec'd digital audio converters and includes both SPDIF and optical I/O ports. An added bonus is the inclusion of a standard AC97 header that allows you to plug in your case's front-panel jack. Finally!

Don't rub your eyes, Creative Labs is licensing its famous X-Fi to Auzentech.

In a listening test using 24-bit/96kHz audio samples, two editors compared the Prelude to Asus's Xonar D2 and both preferred Auzentech's card.

In gaming, the X-Fi Prelude represented well. Its scores were in line with a Creative X-Fi's, albeit slightly slower. What's really important, though, is the Prelude's full support for all of Creative's proprietary EAX technologies.

AUZENTECH X-FI PRELUDE 7.1

HEARING
X-Fi and HD Audio headers on the card.

SMELLING
Must use Auzentech-provided X-Fi drivers.

9

$200, www.auzentech.com

ASUS XONAR D2

Asus tries to hide the origins of the Xonar D2, but it's the same CMedia Oxygen HD 8788 audio processor (or a slightly tailored one) that's featured in several other vendors' soundcards; still, the Xonar D2 features the best implementation of this proc. The Xonar also uses very good Brown Burr DACs to achieve a 118dB signal-to-noise ratio, which is slightly lower than the Prelude's 123dB rating. Most people probably won't hear the difference, but we still give the Prelude the edge over the Xonar card. One editor also felt that the Xonar D2 was a bit too bright with some jazz tracks. Despite this, both listeners gave the card high marks.

We love the card's color-coded LEDs, which let you easily identify the green or red plug. It's definitely easier than squinting to find tiny colored stickers. We were also impressed by the Xonar's high frame rates in our gaming tests, despite its lack of a DSP.

Keep in mind, this card supports only EAX 2, while Creative has reached EAX 5. Of course, everything above EAX 2 is proprietary, so Asus couldn't support EAX 5 without a lot of reverse engineering or a license. As you'd expect, game-audio rendering is quite good on the Xonar, but not as good as the Prelude with its full EAX support.

While the Xonar has an edge in home-theater use due to its real-time Dolby Digital encoding, the Prelude excels at gaming and general PC use.

ASUS XONAR D2

TOM PETTY
Cool LED color-coded ports.

PETTICOAT JUNCTION
Only EAX 2.0 support.

8

$200, www.asus.com

BENCHMARKS

	X-FI PRELUDE 7.1 ANALOG MODE	X0NAR D2 ANALOG MODE	X0NAR D2 DOLBY DIGITAL LIVE	X-FI FATAL1TY
FEAR SOFTWARE MIXING (FPS)	**262**	248	249	256
FEAR SOFTWARE MIXING WITH ADVANCED EAX ON (FPS)	257	242	**259**	250
FEAR SOFTWARE MIXING WITH ADVANCED EAX OFF (FPS)	**254**	N/A	N/A	252
3DMARK03 0 SOUND (FPS)	114	114	**118**	117
3DMARK03 24 SOUND (FPS)	104	**108**	104	106
3DMARK03 60 SOUND (FPS)	94	**102**	96	98

Best scores are bolded. Our test bed is a Windows XP Pro machine using a Core 2 Quad CPU, 2GB of DDR2/800 Corsair RAM, an EVGA 680i SLI motherboard, an EVGA GeForce 8800GTX, and a Western Digital 150GB Raptor.

Cooling Cavalcade

Chilly temperatures can come with a price

This month, CoolIT's Boreas rocks us with a King Kong-like experience by brute-forcing our CPU to new levels of cooling. Gigabyte's rocket cooler, meanwhile, attaches to our test bed with the same strength the Space Shuttle is affixed to its launch pad. Will these CPU coolers be the death of the fabled *Maximum PC* testing apparatus?

—DAVID MURPHY

The Gigabyte 3D Rocket II comes with more accessories than we've ever seen in a cooler.

COOLIT BOREAS

There comes a time in every young PC builder's life when he seriously considers outlandish ideas for modifying and cooling his smokin' new gaming rig. But you don't need to mod your PC into a refrigerator to reach subzero temperatures, not if you have CoolIT's latest 12 TEC cooler, the Boreas.

CoolIT's Boreas could likely fit a stock CPU cooler inside its sprawling gut, a 4-inch-long heatsink with a 12cm fan on each end. Two mounting brackets are preattached to the device, and thank heavens! Few cases have enough room for this chubbo. The included MTEC control box connects the Boreas's automation software to the device, although it uses an entire USB header with absolutely no pass-through.

That's not too bad a sacrifice given the payoff. On its quietest setting, the Boreas beats out the loud Zalman CNPS9700 air cooler in both our idle and burn tests. Cranking the Boreas to the max drops our CPU temperature to 11 C, but created dangerous levels of condensation. It's the Boreas's Achilles' heel: Cool too much and you could destroy your rig. The included software and controller mechanism minimize this issue by letting you pick a temperature for the Boreas to shoot for—a feature sorely missing in previous CoolIT coolers—but finding the perfect setting requires a little experimentation.

COOLIT BOREAS

KRATOS
You will not find a more powerful cooler.

ARES
Ear-splittingly loud when cranked up, uses an entire USB header, tricky condensation.

9

$450, www.coolitsystems.com

GIGABYTE 3D ROCKET II

Let nobody say that Gigabyte didn't break the mold with its 3D Rocket II heatsink/fan combination. As the name alludes, the device resembles a rocket ship sitting atop a launch pad. It's about as well strapped in, too; we applaud the 3D Rocket II for its efforts to sail amongst the heavenly stars of CPU coolers, but its installation process keeps the device strapped firmly to the ground.

We first tried to mount the cooler in our old FX-60 test bed, a relatively painless procedure given how nicely the cooler's single retention bar snaps into the motherboard's mounting mechanism. However, the pressure the cooler placed on the CPU caused our motherboard not to post. The damage, though, wasn't permanent. Everything worked perfectly after we swapped out the 3D Rocket II for a stock AMD cooler.

Installing the cooler on our new Intel Q6700-based test bed forced us to remove the motherboard to install Gigabyte's mounting bracket. We were worried about possibly breaking our CPU by having to push down on the cooler's two retention bars, but the machine posted and gave us results comparable to those of our current air-cooling champion.

The tall cooler barely fits in most cases, forcing you to remove the optional air duct attached to its fan. But that doesn't trouble us nearly as much as the possibility that the 3D Rocket II could grind our processors into dust. Anxiety is the last thing we want in an aftermarket CPU cooler.

GIGABYTE 3D ROCKET II

MAJOR MAJOR
Comes with decorative UV-reactive fluorescent rings and a fan speed controller.

MAJOR TOM
Pushes on the CPU a bit too much; design makes for a tricky installation.

7

$45, www.gigabyte-usa.com

For its bulk, the CoolIT Boreas is surprisingly quiet when its fans are on their lowest setting.

BENCHMARKS

	COOLIT BOREAS (LOW)	COOLIT BOREAS (HIGH)	GIGABYTE 3D ROCKET II	ZALMAN CNPS9700	STOCK COOLER
IDLE (C)	23.8	**11.0**	31.5	37.0	43.8
100% LOAD (C)	44.8	**24.3**	48.5	46.0	67.5

Best scores are bolded. Idle temperatures were measured after an hour of inactivity; load temperatures were measured after an hour's worth of CPU Burn-In (four instances). Test system consists of a stock-clock Q6700 processor on an EVGA 680i motherboard with an Nvidia 8800 GTX graphics card.

Linksys WRT600N Dual-Band Wi-Fi Router

Double your bandwidth, double your fun!

The Linksys WRT600N is the first 802.11n draft 2.0 router we've tested that can operate on both the 2.4GHz and 5GHz frequency bands simultaneously. It's also the most expensive Wi-Fi router we've ever tested.

We tested the router at its default settings: The 5GHz radio operating in 802.11n-only mode and the 2.4GHz radio operating in mixed 802.11b/g/n mode. (Both radios have access to the same integrated four-port gigabit switch.) We used the latter for data and the former for streaming media to Linksys's DMA2200 (reviewed below). The router delivered impressive results, especially while simultaneously transferring data and streaming HD video.

BENCHMARKS

	LINKSYS WRT600N (Data Only)	D-LINK DIR-655 (Data Only)	LINKSYS WRT600N (Data & Media)	D-LINK DIR-655 (Data & Media)
HOME OFFICE, 5 feet (Mb/s)	**129.0**	90.5	**124.0**	50.1
KITCHEN, 20 feet (Mb/s)	**117.0**	67.4	**95.2**	45.3
PATIO, 38 feet (Mb/s)	**114.0**	59.6	**98.2**	46.0
BEDROOM, 60 feet (Mb/s)	**78.1**	28.9	**70.7**	23.6
MEDIA ROOM, 35 feet (Mb/s)	**28.8**	27.3	**36.0**	12.0
OUTDOORS A, 90 feet (Mb/s)	2.1	**8.4**	1.4	**4.6**
OUTDOORS B, 85 feet (Mb/s)	1.1	**2.5**	0.9	**2.0**

Best scores are bolded. See http://tinyurl.com/yo8qa4 for detailed test criteria.

Linksys's Storage Link feature allows you to plug any USB storage device into the WRT600N and operate it as an inexpensive NAS device.

In fact, the WRT600N bested our previous favorite (D-Link's DIR-655) by a whopping 43 percent at close range (see chart). The chasm widened to a staggering 170 percent when the client was placed at its furthest point from the router inside the home, but the gap narrowed to just 5 percent when we compared performance inside the well-insulated media room at Maximum PC Lab North. D-Link's product beat Linksys's when the client was outside the house.

The dual-band feature really came to the fore when we streamed 1080p video clips over the wireless network: The DIR-655's data throughput dropped by nearly half in some situations; the WRT600N's was unaffected.

Not everyone needs a router that can handle conventional traffic, VoIP, and high-definition media all at the same time. If you do, or if your neighborhood is simply jam-packed with competing access points, Linksys's WRT600N should be at the top of your router shopping list.

—MICHAEL BROWN

WRT600N WI-FI ROUTER **9**

$250, www.linksys.com

MAXIMUM PC KICKASS

Linksys DMA2200 Media Center Extender

Streaming at 1080p: worth a deal with the devil?

We've been waiting for media-streaming devices to catch up to 802.11n, and the Linksys DMA2200 does it in style—geek style, that is. The box isn't particularly attractive, but we dig the dual-band Wi-Fi radio inside that's capable of operating on either the 2.4GHz or 5GHz frequency bands.

We also appreciate the built-in DVD player that's capable of scaling our standard-def DVDs to 1080i. (Linksys's DMA2100, the same hardware sans optical drive, sells for $300.) We tested the DMA2200 with Linksys's WRT600N dual-band 802.11n router (reviewed above) and were impressed with the pair's ability to stream high-definition 1080p video to a 42-inch ViewSonic N4285P television across a wireless network, even with the extender inside a cabinet inside our double-walled media room.

The wireless connection stumbled when we tried to stream HD video with 5.1-channel audio attached, however, and it broke down completely when we moved the extender into a more enclosed area of the cabinet. You'll find photos of our test environments at **http://tinyurl.com/28sjsu**.

Aside from delivering the familiar Windows Media Center user interface, the primary advantages that devices like the DMA2200 offer are support for PCs equipped with CableCARD digital tuners and hooks to online media content offered by the likes of Comedy Central, Showtime, and the Discovery Channel. Unfortunately, we found the user interfaces most of those services offer to be utter crap. The ability to pause playback on one media extender and resume it on another, on the other hand, is a slick benefit.

The Linksys DMA2200 supports PCM, MP3, WMA, WMA-Pro, AC-3, and AAC audio; MPEG-1, MPEG-2, WMV9, VC-1, and Xvid video; and JPEG, PNG, BMP, and GIF photo file formats.

Unlike the less-expensive (but only optionally wireless) Xbox 360, this new class of extender freezes out Windows XP Media Center users altogether: Your host PC must run Vista Home Premium or Vista Ultimate. In fact, aside from the wireless feature and the consumer-electronics formfactor, there's not a whole lot here that would lead us to recommend the DMA2200 (or even the cheaper, driveless DMA2100, for that matter) over Microsoft's gaming console—especially if you're into games.

Streaming 1080p video on a wireless network is compelling; being forced to use Vista to do it isn't.

—MICHAEL BROWN

LINKSYS DMA2200 **6**

$350, www.linksys.com

HP Media Vault mv2010

The most non-streaming media server we've tested

HP's Media Vault is like a clumsy, fat version of HP's star-quarterbacking, marathon-running, leather-jacket-wearing MediaSmart Home Server. And that's saying something, considering the MediaSmart EX475 (February 2008) is something of a middling performer. We can't fault HP for trying to make a cheaper, simpler alternative to the Windows Home Server-based MediaSmart, but we're certainly ready to take the company to task for releasing a product that doesn't work as advertised.

The Media Vault should be called the Molasses Vault, as network transfers are akin to a sticky liquid traveling down an incline on a cold winter day. We've tested worse-performing NAS devices, but the Media Vault's transfer speeds are nowhere near those of the top-performing QNAP TS-109 Pro (**http://tinyurl.com/yomys5**). This makes the Media Vault a poor choice for backup scenarios, which could very well take more than 12 hours for a full 300GB drive.

The Media Vault comes in 300GB, 500GB, and 1TB models. HP sent us the smallest Media Vault for our review, and it simply isn't large enough for a network-based device. You can increase its capacity by adding an additional drive to the device's hot-swap drive bay. That's if you don't mind adding to your total purchase price, of course.

It's possible for a product to balance sluggish speeds with jaw-dropping features, and the Media Vault comes close. Its built-in NTI backup software should become a staple of every external storage device created from this point forward—it's just that straightforward an app, and it simplifies the process of backing up specific files and entire hard drives.

Setting up the Media Vault is as easy as transferring various bits and pieces of media to the device—a simple drag-and-drop in Windows Explorer. You don't have to go network hunting to find the Media Vault since the included software maps the Media Vault's various volumes as network drives. This is a far cry from other NAS devices we've tested, which practically require one to acquire a map, a parrot, and a sailing vessel to find shared folders.

As for its streaming capabilities, the Media Vault is incompatible with Windows Media Player 11 and the Xbox 360. And we're not sure who to point our finger at—the Media Vault's streaming technology is based on UPnP A/V. An Xbox 360 should be able to see the Media Vault on the network as if it were a normal Vista machine and play media files accordingly. It doesn't. Neither does Windows Media Player 11, which, according to HP is a Media Player issue. HP offers a fix (**http://tinyurl.com/yolkcn**), but it is just a way to set up monitored folders, not a means of accessing the device as if it were a networked computer's library.

The TS-109 Pro and other NAS devices we've tested are fully compatible with WMP 11 and the Xbox 360, so we're not asking for the impossible when it comes to streaming compatibility. However, it's not as if the Media Vault is completely incapable of streaming media—you can still browse and watch your media via Windows Explorer, which is a small consolation, we suppose. (See this month's In the Lab for more on this issue.)

We remain at a loss as to what to do with a media server that doesn't stream. We'd be consoled if the Media Vault were awesome for file backups, but its amazing software simply can't compensate for the device's subpar speeds. One can only hope that subsequent iterations in the Media Vault line address the issues of this good-on-paper, subpar-in-practice device.

—DAVID MURPHY

The front-loading hot-swap bay is one of the Media Vault's nicest (and seemingly only) features. Adding extra storage takes less than two minutes!

BENCHMARKS

	HP MEDIA VAULT	QNAP TS-109 PRO	PERCENT FASTER
PC TO NAS			
SMALL (MIN:SEC)	0:59	**0:37**	37.3%
LARGE (MIN:SEC)	4:08	**2:25**	41.5%
NAS TO PC			
SMALL (MIN:SEC)	0:45	**0:43**	37.3%
LARGE (MIN:SEC)	3:10	**2:44**	13.7%

Best scores are bolded. We used the CD contents of Maximum PC's November 2007 CD for the small-file testing, and a single 2.8GB file for the large-file testing. All scores are averages of three transfer trials. Scores for the QNAP enclosure were obtained using a provided 750GB Seagate 7200.10 Barracuda drive.

HP MEDIA VAULT MV2010

SCROOGE MCDUCK

Strong backup software, newbie-friendly expansion, simple installation.

6

FLINTHEART GLOMGOLD

Tiny included drive, slow transfer speeds, media streaming incompatibility issues (no iTunes either!).

$250, www.hp.com

Thermaltake SwordM

It slices, it dices, it rocks!

Like Bill's Hanzo sword, Luke's lightsaber, and Gordon Freeman's crowbar, Thermaltake's newest chassis appears unconvincingly plain—until you take it out for a spin. The SwordM dices through our typical chassis frustrations like a chain saw through a burrito. This is truly a next-generation case.

The SwordM's side panel is split into two halves: A section covering the front bays swings freely, while the grated chunk covering the motherboard area pops open with a pleasant *whoosh*—because it's attached to the case with two hydraulic arms. This is an improved version of what Thermaltake used in its Tai-Chi case (Holiday 2005), and we're glad the design isn't a simple vanity accessory. The Terminator-style appendage is an elegant solution to flimsy side panels and their oft-stupid connection mechanisms.

Unlike in a typical case, the SwordM's motherboard rear connectors are surrounded by absolutely nothing—goodbye, trusty I/O shield. We love the free-hanging look created by the motherboard and its various PCI cards, which are themselves protected and concealed by the rounded back half of the case. You string your cables through two holes in the case's rear, although dual-monitor, USB-filling, surround-sound-rocking, water-cooling users will find this to be quite a tight fit.

For all the awesome construction, we were a bit miffed to see such a lame, screw-filled hard-drive bay. And the SwordM comes with room for only three drives. That's a bit strange given the case's pronounced size and awesome connectors. We're nitpicking, but we also don't like slapping hard drives into 5.25-inch bays.

The SwordM remains vivid and clutter-free, even accounting for all of its great features—including superlong front-panel connection wires, room for 12 12-centimenter fans, and a front-panel storage container. Thermaltake didn't just toss in the kitchen sink with the SwordM. No, it took out its styling brush and painted up an elegant representation of just how much this company *gets* case design. A few minor blotches (such as the finicky cabling situation in the rear) sully the detail work, but we remain quite impressed with the big picture.

Front-panel connection trifecta: The SwordM supports USB, FireWire, and eSATA.

—DAVID MURPHY

THERMALTAKE SWORDM **9**

$500, www.thermaltakeusa.com

Headplay Personal Cinema

Welcome to noggin theater

If you're just dying to strap a display to your head, the Headplay Personal Cinema is your best choice. It's comfortable, even for people who wear glasses, supports a wide range of input devices, and delivers relatively high resolution, and the only virtual-reality feature it lacks is head tracking.

The Headplay's liquid crystal on silicon (LCoS) display, which sports an 800x600 resolution, is a step above the Vuzix iWear VR920's LCD, which is limited to 640x480. And while the Headplay's simple padded visor might look cheap, it's much more comfortable than the Vuzix's eyeglass frames. The inclusion of focus sliders enables even folks who need prescription bifocals to use the Headplay without their cheaters. (There's an interpupillary adjustment, too.)

Flexibility is the Headplay's other strong suit. Rather than plug straight into your PC, the visor connects to a powered brick (battery power is also an option) with a host of inputs, including VGA, S-video, mini USB 2.0, and two USB 2.0 ports (acting as either host or client); there's even a Compact Flash slot. The earbuds aren't integrated into the visor, which makes it easy to replace them with your own.

The Headplay supports Nvidia's stereoscopic drivers, but we consider this to be a checklist item rather than a crucial feature: Nvidia is notorious for leaving stereoscopic support out of its most recent drivers, and AMD doesn't support stereoscopic viewing at all.

The primary advantage that manufacturers such as Headplay and Vuzix always boast of is that playing a game or watching a movie on their headsets is equivalent to sitting in front of a 50- or 60-inch conventional display. While that may be true, it doesn't change the fact that the displays these headsets provide are extended definition at best, with a 4:3 aspect ratio. For the price of the Headplay Personal Cinema, you could buy a 24-inch monitor capable of a 1920x1200 resolution and a 16:9 aspect ratio. You won't be able to watch porn in secret, but you will get a compelling visual experience.

Headplay Personal Cinema offers the best price/performance ratio of any head-mounted display system we've tested.

—MICHAEL BROWN

HEADPLAY CINEMA **7**

$500, www.headplay.com

Razer Mako 2.1 Speaker System

Delightfully different

You'll find the THX logo stamped on a host of products, but Razer's Mako 2.1 system is the first consumer speaker system that THX—led by THX Chief Scientist Laurie Fincham—has designed from the ground up.

And while Razer is known for its edgy industrial design, there's more to the mushroomesque profile of this 2.1-channel speaker system than provocative looks. The shape of the satellite and subwoofer cabinets is a function of two new THX technologies: THX Ground Plane and THX Slot Speaker.

Typical stereo speakers have a narrowly defined sweet spot caused by the triangular projection of their sound waves: The path to your ears is narrow at the cabinet and spreads wide as the waves move into the room. In THX's design, the tweeter and midrange drivers point straight down, and the sound waves are channeled through a narrow slot at the bottom of the round cabinets.

According to THX, this design remedies a fundamental flaw with the classic box-shaped speaker cabinet: With the traditional design, some sound waves travel on a horizontal plane directly toward the ear, while others reflect off whatever surface the cabinet is resting on and interfere with the sound waves traveling the more direct path. THX claims its technology overcomes that problem by bouncing *all* the sound waves off the desktop.

As much sense as that argument makes, we found the Mako satellites to be only on par with other high-end speaker systems we've auditioned—Blue Sky's EXO 2.1 is one example—and all of those have featured box cabinets. But THX *does* deliver on its promise to create what it calls an "omni-directional" sound stage: We could sit or stand anywhere in our home-office test environment and still be in the stereo sweet spot.

This last characteristic is great for recreational music listening or movie watching, but it's much less important for gaming because you tend to be centered in the sweet spot anyway. The Mako's subwoofer kicks all kinds of ass, but the system as a whole can't dislodge the sub-less Audioengine 5 from its slot on our Best of the Best list.

The Mako 2.1 speaker system includes one of the best subwoofers we've heard in this price range, serving up tight, punchy bass from everything we threw at it.

—MICHAEL BROWN

RAZER MAKO 2.1 **8**

$400, www.razerzone.com

Soundcast OutCast Outdoor Speaker

Boom for your outdoor room—no strings attached

The OutCast is a dead-simple means of bringing your music outdoors; what it will do for neighborly relations is a whole other question.

Soundcast has embedded its wireless iPod streaming technology inside a fantastic battery-powered, self-amplified outdoor speaker. It's pricey, but building a good wired outdoor system would cost as much—even if you do the work yourself.

The system includes an iCast transmitter, which captures the analog output from your iPod and streams it to the OutCast on the 2.4GHz frequency band. If you rock with an MP3 player *other* than an iPod, or if you want to stream music from your PC, the 1/8-inch headphone jack on the back of the iCast automatically becomes a line-level input when there's no iPod in the dock.

Membrane switches on the top of the speaker enable you to control a docked iPod, although you're limited to track forward/back, play/pause, and volume (there's no way to control any other source). There's no display, so you'll want to build a playlist or leave the iPod in shuffle mode. You can also get around the display issue by plugging any player directly into the OutCast and stashing it in the cradle built into the handle.

A 100-watt amp delivers plenty of volume to the four 3-inch high-frequency drivers arranged around the top of the columnar device, while an 8-inch down-firing woofer delivers lots of beefy bass. The speaker sounded great on our enclosed patio, only slightly less so when we moved it out into our yard (where it was deprived of walls and a ceiling to provide natural reverb). The system delivered impressive range, too, streaming audio outside within a 135-foot radius of the transmitter inside the house. But the amp doesn't like to be pushed; it distorted badly long before we reached its maximum output.

The OutCast is thoroughly weatherized, as long as you don't leave anything plugged into it. Soundcast says the NiMH battery pack will deliver 10 hours of audio on a charge, but we were able to squeeze out 15 hours playing at lower volume (and leaving the cheesy mood lighting turned off). We dig it, but the price tag denies it a Kick Ass award.

—MICHAEL BROWN

SOUNDCAST OUTCAST 9

$700, www.soundcastsystems.com

hField Technologies Wi-Fire Wi-Fi Adapter

There's life in 802.11g after all!

The Wi-Fire's range is flat-out amazing, but the antenna's cheap mounting stand cost it a Kick Ass award.

We sometimes get so caught up in the excitement of the "next big thing" we throw the baby out with the bathwater. Based on the performance of the Wi-Fire Wi-Fi adapter, that might just be the case with IEEE 802.11g wireless routers.

If you value range over throughput, this is the Wi-Fi adapter for you. This ungainly device doesn't rely on MIMO or IEEE 8011.n; heck, it doesn't even require a PCMCIA slot. When we plugged it into our notebook's USB 2.0 port, it delivered unbelievable range with a year-old Asus WL700gE router equipped with a single antenna.

BENCHMARKS

	LINKSYS WPC600N/ LINKSYS WRT600N	LINKSYS WPC600N/ ASUS WL700GE	WI-FIRE/ ASUS WL700GE
HOME OFFICE, 5 FEET (Mb/s)	**129.0**	20.9	20.8
KITCHEN, 20 FEET (Mb/s)	**117.0**	20.9	21.0
PATIO, 38 FEET (Mb/s)	**114.0**	20.8	20.8
BEDROOM, 60 FEET (Mb/s)	**117.0**	16.9	18.4
MEDIA ROOM, 35 FEET (Mb/s)	**117.0**	13.0	15.8
OUTDOORS A, 90 FEET (Mb/s)	2.5	2.7	**15.2**
OUTDOORS B, 85 FEET (Mb/s)	1.1	3.4	**15.1**
OUTDOORS C, 135 FEET (Mb/s)	no connection	no connection	**13.2**
OUTDOORS D, 350 FEET (Mb/s)	no connection	no connection	**14.5**

Best scores are bolded. See ***http://tinyurl.com/yo8qa4*** *for detailed test criteria.*

Indoors, the Wi-Fire performed no better than Linksys's WPC600N adapter, and no 802.11g router can match the maximum throughput of an 802.11n model. But the Wi-Fire lived up to its name when we moved the notebook outdoors, delivering TCP throughput of 15Mb/s (compared to just 2.7Mb/s for the Linksys).

Our jaws really dropped as we moved the notebook ever further away: 350 feet from the router, with the signal passing through an insulated, double-thick interior wall and a steel garage door, the Wi-Fire delivered TCP throughput of 14.5Mb/s. Maximum range dropped to 135 feet on the other side of the house (which added four insulated interior walls, a set of plywood cabinets, and an insulated exterior wall with fiber-cement siding), but throughput remained steady at 13.2Mb/s.

The antenna is extremely directional, which wouldn't be a problem if it weren't mounted so loosely to its plastic stand. You can set it on a tabletop or clip it to your notebook screen, but after you've painstakingly located the reception sweet spot, the simple act of breathing is enough to move it out of position. We completely lost our connection only when it pivoted at extreme range, but at no point was the fit sufficiently tight to keep the antenna stationary.

—MICHAEL BROWN

WI-FIRE WI-FI ADAPTER 9

$80, www.hfield.com

Sins of a Solar Empire

So good, you'll never want to repent

4X (explore, expand, exploit, and exterminate) strategy games rarely gain widespread popularity. They're like the mathletes club in high school—a haven for only the most hardcore of geeks. Sins of a Solar Empire vitalizes the genre by automating most of the micromanagement and replacing monotonous turn-based drudgery with faster-paced real-time gameplay.

Aside from the opening cinematic, there's no plot or story to drive the single-player mode. Solo play is limited to skirmish games in which you pick one of three factions to use in an epic battle to conquer the map. Depending on the map size (up to 10 players can occupy nine massive solar systems, each with dozens of planets), skirmish sessions can last anywhere from an hour to more than a day.

And that's the beauty of Sins; it scales all the things we like about the RTS genre into interstellar campaigns of epic proportion. Space exploration, technology research, and unit management are all drawn out over the span of a game (i.e., it's rarely possible to explore the entire map before a game's end). The balanced pacing gives you adequate time to develop every facet of your empire, so unlike in most RTS games, which favor the speediest player, you never feel as though you've fallen too far behind the curve.

In combat, the game plays like a mixture of Risk and Homeworld. Carefully plotting assault routes between planets and asteroids to surprise an opponent requires strategic finesse, and the reward of razing an undefended territory is very satisfying. We really dig the option to keep the ship-to-ship combat relatively hands-off, as we loved zooming in to survey glorious capital ship battles while the AI competently handles the micromanagement of the fleet.

Each team can build up to 400 vessels, including 16 massive capital ships.

Devious players will also adore the robust selection of passive-aggressive options, such as the ability to bribe local pirates to raid enemies or forge alliances and cease fires to manipulate opponents. The fine mix of 4X-style depth and RTS-inspired design makes for an irresistible and addictive combination. Just be warned, once you're sucked in, don't be surprised to find yourself losing track of time and playing matches until 4 a.m.

—NORMAN CHAN

SINS OF A SOLAR EMPIRE **9**

$40, www.sinsofasolarempire.com

ESRB: T

MAXIMUM PC KICKASS

Win R[illegible] Month

WIN BIG!

IF YOUR MODDED PC IS CHOSEN AS A RIG OF THE MONTH, IT WILL:

2 Win you a $250 gift certificate

TO ENTER: Your submission packet must contain your name, street address, and daytime phone number; no fewer than three high-res JPEGs (minimum size 1024x768) of your modified PC; and a 300-word description of what your PC represents and how it was modified. Emailed submissions should be sent to **rig@maximumpc.com**. Snail mail submissions should be sent to Rig of the Month, c/o Maximum PC, 4000 Shoreline Court, Suite 400, South San Francisco, CA 94080.

The judges will be *Maximum PC* editors, and they will base their decision on the following criteria: creativity and craftsmanship.

ONE ENTRY PER HOUSEHOLD. Your contest entry will be valid until (1) six months after its submission or (2) March 1, 2008, whichever date is earlier. Each month a winner will be chosen from the existing pool of valid entries, and featured in the Rig of the Month department of the magazine. The final winner in this contest will be announced in the May 2008 issue. Each of the judging criteria (creativity and craftsmanship) will be weighed equally at 50 percent. By entering this contest you agree that Future US, Inc. may use your name and your mod's likeness for promotional purposes without further payment. All prizes will be awarded and no minimum number of entries is required. Prizes won by minors will be awarded to their parents or legal guardians. Future US, Inc. is not responsible for damages or expenses that the winners might incur as a result of the Contest or the receipt of a prize, and winners are responsible for income taxes based on the value of the prize received. A list of winners may also be obtained by sending a stamped, self-addressed envelope to Future US, Inc. c/o Maximum PC Rig of the Month, 4000 Shoreline Ct, Suite 400, South San Francisco, CA 94080. This contest is limited to residents of the United States. No purchase necessary; void in Arizona, Maryland, Vermont, Puerto Rico, and where prohibited by law.

We tackle tough reader questions on...

✓Router Issues ✓Dual-Boot OEM Machines ✓Security Systems ✓Wake on LAN Usage

GATEWAY TO XP

I am having a real problem getting an XP downgrade CD from Gateway. When I purchased a laptop from the company about eight months ago, I had no idea that programs I use for work were inoperable with Vista.

I did not use the unit for six months, and I think something should be done about this.

—Sharnetta

SENIOR EDITOR GORDON MAH UNG RESPONDS: Unfortunately, you're probably screwed since your laptop is most likely a Vista-only SKU. Since we don't know your laptop's model number, there's no way we can say for certain, but there may not be an XP downgrade for your machine. The safest course of action when buying a new computer is to make sure that it is available with Windows XP before you purchase it.

WILIFE OR YOUR LIFE?

I'm interested in adding a security system to my PC and was wondering if you had any suggestions. I was looking at the WiLife system ***Maximum PC*** *reviewed in September 2007, but after speaking to one of the company's reps, I found that the device has to be plugged into the wall and could monitor only the area that the wall outlet faced. If you don't have an outlet facing the area you want to monitor, you're out of luck.*

What I'd like is something that can monitor any area I want, indoors or outdoors; is motion activated, so it's not recording unless there's something to record; I can access online from work; stores the recorded files on my PC and online; isn't wireless; is easy to set up; and is able to handle enough cameras to monitor four indoor areas and all around the outside of my house.

I would also prefer if additional dummy cameras could be purchased to supplement areas outside while keeping costs down.

—Shane Sarff

EXECUTIVE EDITOR MICHAEL BROWN RESPONDS: I've done most of the security-camera reviews published here at *Maximum PC*, and I have an extensive deployment of WiLife gear at my home.

You are correct that those cameras can monitor only areas within reach of an electrical outlet, but I don't know of any surveillance system that doesn't require some form of hard-wiring—either Ethernet cable or AC wiring. You can always run an extension cord from your nearest outlet to the camera's location.

Toshiba's IK-WB15A surveillance camera is capable of running on either AC power or power-over-Ethernet (POE). But you'll still need to run Ethernet from your router or switch to the camera, and if your switch doesn't support

Dying Routers, We've Got Them Too!

I have a major beef with Michael Brown and his review of Netgear's WNR854T (November 2007). The only dings he gave this product were minor complaints about range and a setup glitch. I purchased three of these devices for my home and business based on the review; incredibly, all three have died. While I realize it might be tough to determine the long-term reliability of a product in a few days of testing, the massive consumer backlash on myriad consumer-review sites should prompt you to reconsider the very positive review you gave this product.

—Iam Umland

EXECUTIVE EDITOR MICHAEL BROWN RESPONDS: We don't take our review cues from web forums; such wisdom-of-the-crowd reviews can be useful, but we have no way of verifying their veracity. Your three-out-of-three failure rate, on the other hand, is pretty remarkable, all the more so because Editor in Chief Will Smith also experienced the failure of a Netgear WNR854T. We dismissed it as an anomaly at the time, but your letter prompted us to contact Netgear to get its side of the story. Here's what the company had to say: "Netgear believes a small percentage of WNR854T units have malfunctioned in the field while operating under extreme usage and in elevated temperature conditions. Netgear identified and fixed the issue earlier last year. Netgear offers a standard one-year repair or replacement warranty on all routers selling in the U.S. Customers who have experienced a malfunction of their in-warranty Netgear product will be able to get a replacement product."

We pride ourselves on testing products in real-world conditions, and we didn't experience any problems with the WNR854T while we were testing it. It would have been unfair of us to report the failure of one evaluation unit long after we'd finished testing as indicative of a design flaw present in every unit, and we still can't make that claim. We hope you were able to have your routers repaired or replaced without a hassle. Since you purchased them after reading our review, they should still be under warranty.

CUTCOPYPASTE

Corrections to our March 2008 "Windows Tips" story.

- In the process-killing tip on page 23, we reversed the default values for WaitToKillApps and HungAppTimeout.
- The correct URL for the Microsoft Private Folder Utility mentioned on page 24 is **http://tinyurl.com/kxdx8**.
- On page 34, we stated that Creative ALchemy was free for all Creative soundcard users. While it is free for X-Fi users, it costs $10 if you use another supported card.

POE, you'll need to buy a power injector. The Toshiba camera has motorized tilt and swivel, which greatly increases its coverage area. Here's my review of that product: http://tinyurl.com/28g962.

IControl has a wireless system based on Z-Wave technology, but here again, you need to plug the cameras into an electrical socket: http://tinyurl.com/2cu5j7.

We'll be reviewing more of these types of products in the future, as well.

WAKE ON LAN? NOPE

When my friend asked me how to securely and easily access his home computer remotely, it was one of the only how-tos I couldn't satisfactorily answer. Although you covered this topic in "Use Your Computer from Anywhere" (February 2008), I have two questions that weren't fully addressed in the article.

First, how does the method you described account for dynamic IP addresses? Would you have to reconfigure each time a new address is assigned? Second, how could one configure and use Wake on LAN with this to turn on the computer remotely?

—Peter Zunitch

ASSOCIATE EDITOR DAVID MURPHY RESPONDS: The beauty of Hamachi is that whenever a PC connects to the Hamachi network you've set up, you'll see the machine's IP address right there in the window. It might change depending on the specific way Hamachi doles out IP addresses, but that's a moot point. Just type the IP address in the Hamachi window into your UltraVNC connection window.

As for Wake on LAN features, you're stuck. Hamachi is a software tunnel, and it doesn't include a function to wake a sleeping computer. Getting Wake on LAN to work on even an actual LAN can be kind of hairy.

OEMS HATE THE DUAL BOOT

After reading system reviews in your recent issues, I noticed that you guys are convinced that XP performs better than Vista in gaming. I agree. I have a C2D dual-boot system with XP and Vista and have benchmarked both and see the benefits of XP at this time.

Vendors have to notice that you dock systems that run only Vista. Why don't more vendors offer dual-boot systems?

—Bobby Keller

SENIOR EDITOR GORDON MAH UNG RESPONDS: When Vista first came out and the drivers were horrible, vendors shipped dual-boot boxes. As time went on and Vista drivers still sucked, vendors continued to offer XP. Recently, we've seen a few Vista-only machines. Why? We're not sure, but it's possible that 1) vendors haven't been following current events, 2) Microsoft's licensing requirements force vendors to do this, or 3) vendors don't think Vista's that bad.

Vista performance continues to be pretty terrible, but we are still open to reviewing Vista-only boxes. As with all of our system reviews, we leave the configuration specifics up to the vendor.

NO PROBLEMS ON OUR END, MA'AM

I am wondering if something could possibly be wrong with the Luxor 3 game supplied on the CD that was bundled with the February 2008 issue. ThreatFire has it quarantined because it was trying to copy itself to other areas of my drive when I tried to uninstall it.

I had just finished restoring my system, and you can image my frustration when this happened. On the bright side, thanks to ThreatFire, it was caught. But because the files are in the TF vault, I can't uninstall the program. Please tell me how to solve this problem; I'd like to have all files associated with this program removed from my system.

—Mrs. Dawson

ASSOCIATE EDITOR DAVID MURPHY RESPONDS: I've installed ThreatFire on my machine and successfully reinstalled and uninstalled the Luxor 3 game with no problems whatsoever. So unfortunately, I'm not sure what to tell you regarding your situation! Rest assured, though, that we check every program we place on the *Maximum PC* disc for installation issues and viruses—multiple times, in fact.

That said, you can delete the program folder from your Program Files directory. It's not as good a solution as a routine uninstall process, but it will free up space on your drive! MPC

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COMING NEXT MONTH IN MAXIMUM PC'S

EXCLUSIVELY TESTED ON ANIMALS MAY ISSUE

THE MOVIE DOWNLOAD GUIDE

Everywhere you look, a new device or service is promising to download or stream major movie releases and TV shows directly to your living room—even in high def. Next month, we'll put the biggies to the test.

RAID CHALLENGE

Are the performance returns from an add-on RAID card worth the cost? Is a discrete controller card significantly better than one that's host based? Tune in to find out.

SOFTY AWARDS

We'll pay homage to the software applications and utilities that have captured our hearts this year. Expect to find some new favorites.

DANIEL KLUS'S

Jan Henryk Dabrowski's Castle

A huge fan of the Total War series, 17-year-old Daniel Klus decided to channel his passion for all things medieval by designing a castle case. But his year-long project doesn't reflect his love for any ol' generic castle. He based his case on an actual Polish castle design as a tribute to his heritage, his culture, and 18th-century Polish general Jan Henryk Dabrowski.

Klus constructed the sides of the castle out of Spanish cedar; after joining them together, he installed a stained glass window on each side: The left side of the case features Dabrowski's coat of arms; on the right is the Polish coat of arms.

There's no drawbridge on this guy, but the front door actually works! Peeking past the laser-cut ironwork on the front reveals a storage area for games, movies, and other media.

Klu for the castle with a hand router and us wi days, but it's certainly more efficient!

The ancient exterior belies the rig's modern accoutrements: This castle sports a Core 2 Duo E6850 processor, two SLI Evga 8800 GTX graphics cards, 2GB of memory, and a kilowatt power supply.

For his winning entry, Daniel wins a $500 gift certificate to fund his modding madness! Turn to page 92 for contest rules.

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